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ENVIRONMENTAL IMPACT STATEMENT

NUCLA-TELLURIDE TRANSMISSION LINE PROJECT

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SUMMARY

March 2001

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NUCLA-TELLURIDE TRANSMISSION LINE PROJECT

SUMMARY

March 2001

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INTRODUCTION

Tri-State Generation and Transmission Association (Tri-State) is proposing to construct and operate a new single-circuit 115 kilovolt (kV) transmission line in southwestern Colorado between the Nucla Substation and either the Sunshine Substation or the Telluride Substation. This document is a summary of the Nucla-Telluride Transmission Line Project draft Environmental Impact Statement (EIS). The EIS analyzes the proposed action and alternatives, and describes their environmental effects on federal, state and private lands. *Figure SUMMARY-1* shows the project vicinity and transmission alternatives under consideration.

The draft EIS has been prepared in compliance with the National Environmental Policy Act of 1969 (NEPA). The U.S. Department of Agriculture (USDA) Forest Service, Rocky Mountain Region, Grand Mesa, Uncompahgre and Gunnison (GMUG) National Forests (Forest Service) is the federal lead agency for NEPA compliance. The U.S. Department of Interior (USDI) Bureau of Land Management (BLM) and the USDA Rural Utilities Service (RUS) are cooperating federal agencies in the NEPA process.

PURPOSE AND NEED

In 1998 Tri-State proposed to rebuild and replace the existing 69 kV transmission line between the Nucla and Sunshine Substations. Tri-State's proposal would affect National Forest, BLM and private lands. Tri-State has identified the need to replace the existing 69 kV line with a single-circuit 115 kV transmission line for the following reasons:

1. To alleviate regional system overloads and improve load serving capacity in southwestern Colorado;
2. To provide a long-term source of reliable power to the Telluride Area;
3. To improve the quality of electrical power service to a number of smaller communities in the region, including Telluride, Norwood, Rockwood, Purgatory and Silverton; and
4. To increase the load serving capacity of the transmission system in southwestern Colorado.

The existing Nucla-Sunshine 69 kV line is more than 50 years old and has a capacity of 13 megawatts (MW). The proposed 115 kV line would have a capacity of approximately 55 MW.

Alleviating Regional System Overloads and Increasing Load Serving Capacity - The southwestern Colorado regional power system, termed 'TOT2A', encompasses the area between Montrose, Colorado and the New Mexico/Colorado border. Tri-State is responsible for transferring power to both their local cooperative members and to regional customers through their transmission grid. The regional electrical grid is operated for two primary purposes: to reliably serve the existing and projected loads in the region; and to provide bulk power transfers through the region for the Western Area Power Administration. Power system planning for the region is coordinated through the Western Systems Coordinating Council (WSCC), that is composed of a number of utilities. Planning studies conducted by Tri-State in the mid-1990s for the WSCC concluded that overload conditions on the regional grid would result in low voltages and system overloads in the future. In order to remedy the regional electrical grid problems, Tri-State is planning on making a number of system modifications, including replacing the existing 69 kV Nucla-Sunshine line with a new 115 kV system.

If approved by federal, state and local permitting agencies, the replacement of the existing Nucla-Sunshine 69 kV line with a 115 kV system would help Tri-State meet their obligations for bulk power transfers while at the same time providing a reliable source of power to the Telluride Area for the foreseeable future. The proposed transmission line would provide an additional 15 MW of benefits for regional power transfers on the TOT2A grid, and would increase the southwestern Colorado load serving capacity by 30 MW. Other local communities would also benefit from improved quality of power service.

Improving Power Reliability and Quality of Service for the Telluride Area and Surrounding Communities **-** Southwestern Colorado, and in particular the Telluride Area, has been and continues to experience significant increases in power demand due to the growing population and related expansions of the ski area and tourism economy. Power to the Telluride Area is provided by San Miguel Power Association (SMPA), a cooperative member of Tri-State. SMPA estimates that by 2015, annual peak demands in Telluride and the surrounding area may reach approximately 30 MW. The Telluride Area receives its primary power supply from the Hesperus-Telluride 115 kV transmission line. This line has a capacity of 32 MW and will be able to meet the Telluride Area's power demands into the foreseeable future.

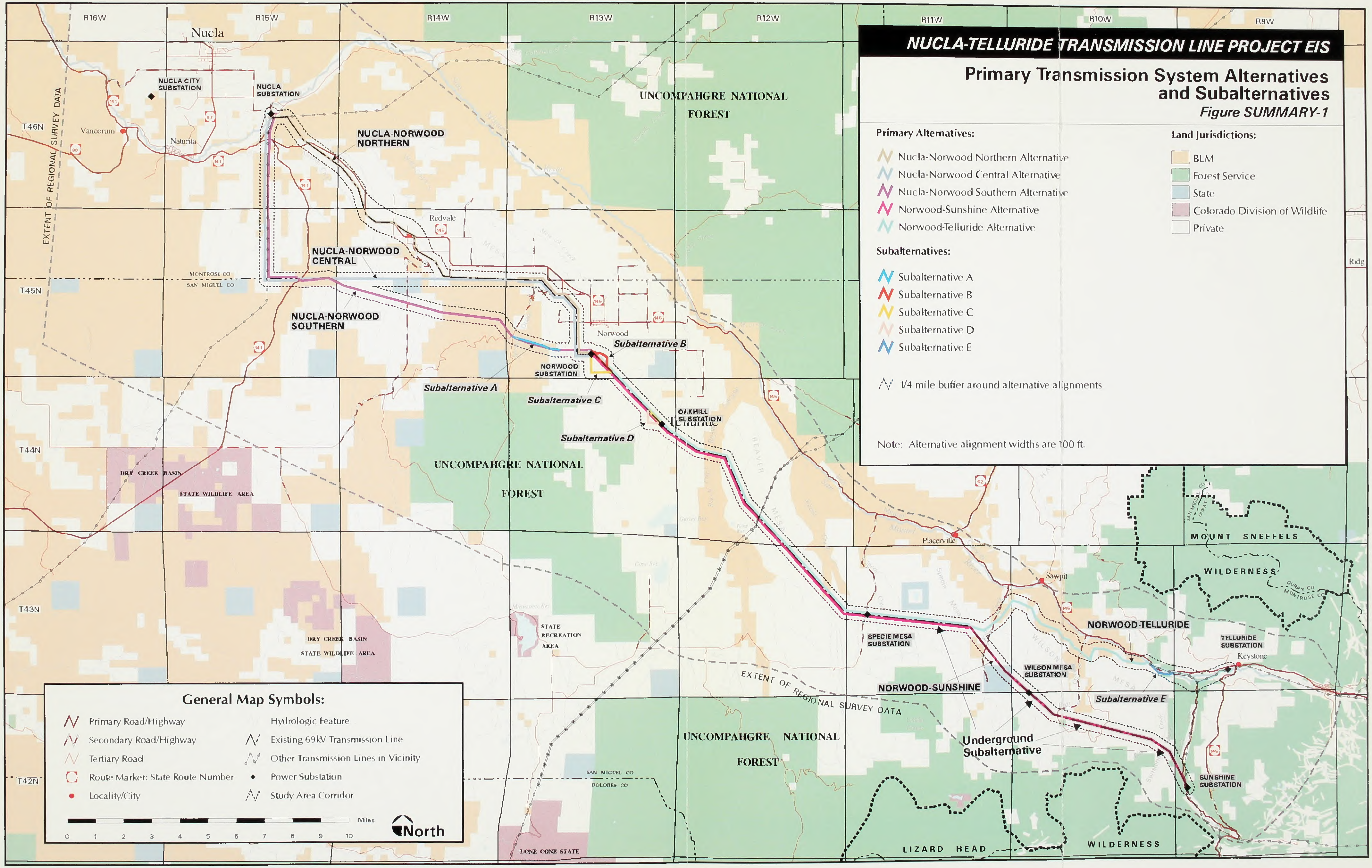
The Hesperus-Telluride line is subject to major hazards and power outage risks, however, due to its location across rugged mountainous terrain, including Ophir, Molas and Coal Bank Passes. These mountain passes routinely experience severe winter weather including heavy snowfalls, avalanches, and high winds. Until recently, the 13 MW of power that is available from the Nucla-Sunshine 69 kV line was sufficient to provide backup power to Telluride in the event of an outage on the Hesperus-Telluride line. Due to the growing demand for power in the Telluride Area, this 13 MW of power can no longer fully back up the loads in Telluride, particularly during the winter months when demand is highest.

The ramifications of not having a reliable source of backup power in the Telluride Area are significant and include risks to human health and safety as well as the local tourism economy. Should an outage on the Hesperus-Telluride line occur during the winter, an extended outage could occur in Telluride, Mountain Village and surrounding communities such as Ophir and Placerville, and to residents of Wilson, Sunshine and Specie Mesas. During emergency conditions, the existing Nucla-Sunshine 69 kV line can be operated in a manner to provide up to 26 MW of power. This option, however, will soon be insufficient to cover the winter power loads. An extended outage would affect a number of community services and functions that do not have individual backup generators.

A number of other communities are also at risk of increasing power outages and unreliable power supplies given the age and continuing deterioration of the 50-year-old Nucla-Sunshine 69 kV line. Outages from increasing maintenance, lightning strikes and other causes are resulting in less reliable power service to residents of Norwood, Wrights Mesa and surrounding rural areas.

THE PROPOSED ACTION

Tri-State has stated that the proposed 115 kV transmission line could connect between the Nucla Substation in Montrose County and either the Telluride Substation or the Sunshine Substation in San Miguel County. The 115 kV line would be supported on wood poles. Structure designs would vary from single poles to H-frame or three-pole structures depending upon engineering requirements and landowner wishes. The new transmission line would be 80 feet tall on average, approximately twice as tall as the existing 69 kV wood poles. *Figure SUMMARY-2* shows representative transmission pole designs. Increased pole heights are needed to meet present-day design standards required by the RUS for funding. Present-day pole designs provide adequate spacing between conductors for raptor protection, necessary ground clearances for public safety, as well as inclusion of a static line for lightning protection. The static line would also contain fiber optic cable that would be available to local providers of high-speed Internet services. Right-of-way requirements would vary between 75 feet and 100 feet depending on the pole type.

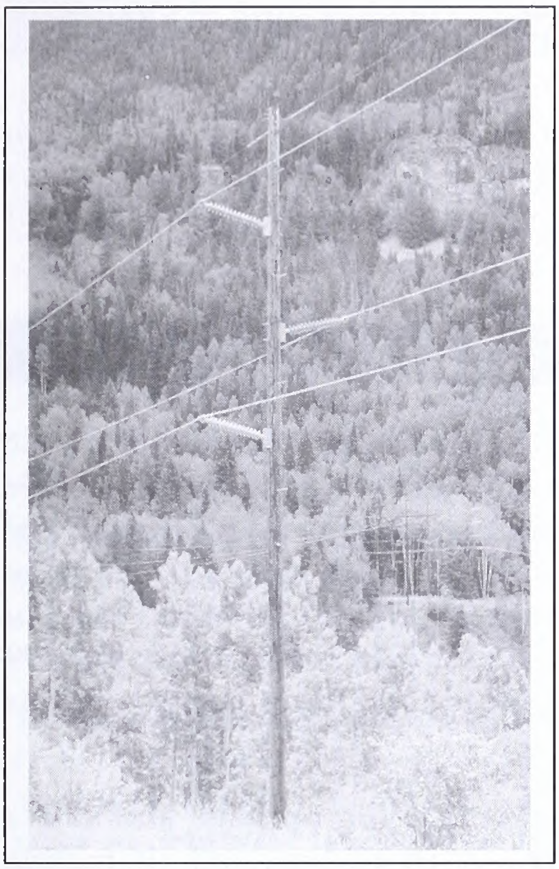


NUCLA-TELLURIDE TRANSMISSION LINE PROJECT EIS

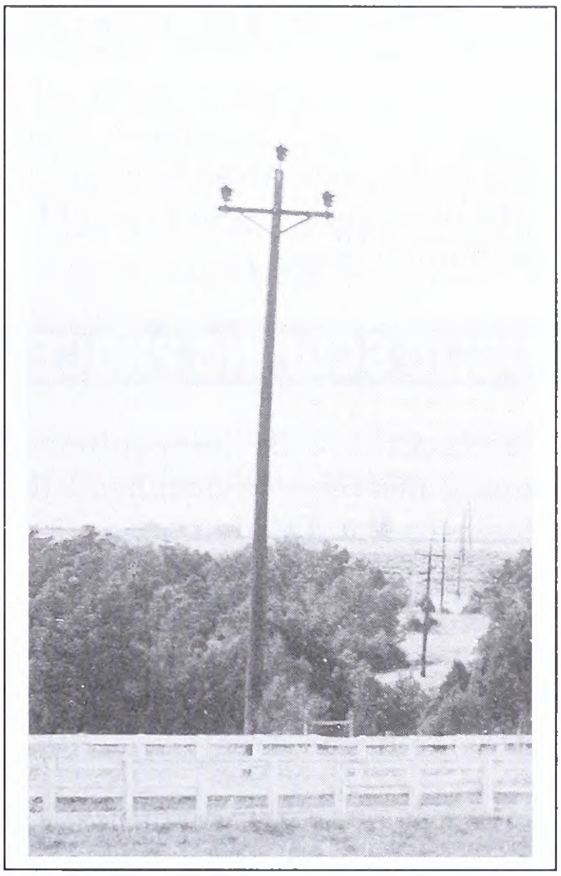
Primary Transmission System Alternatives and Subalternatives

Figure SUMMARY-1

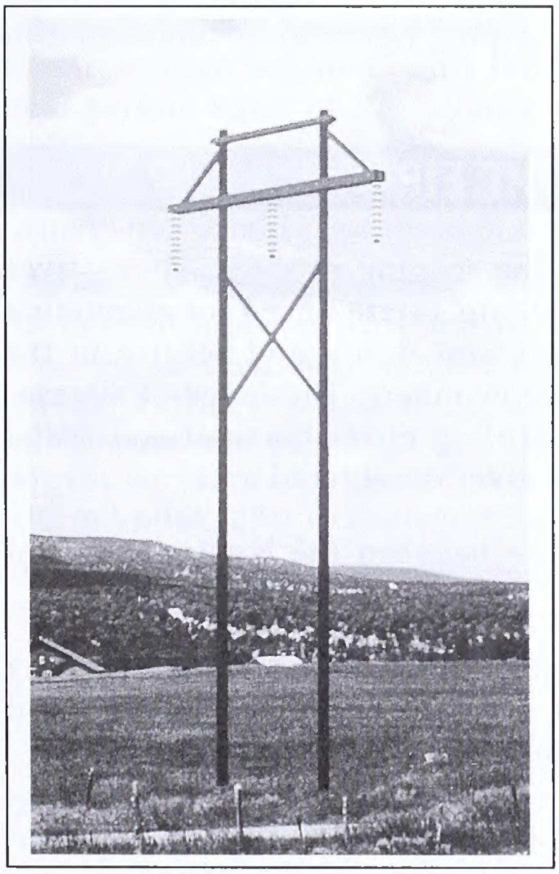
Note: Alternative alignment widths are 100 ft.



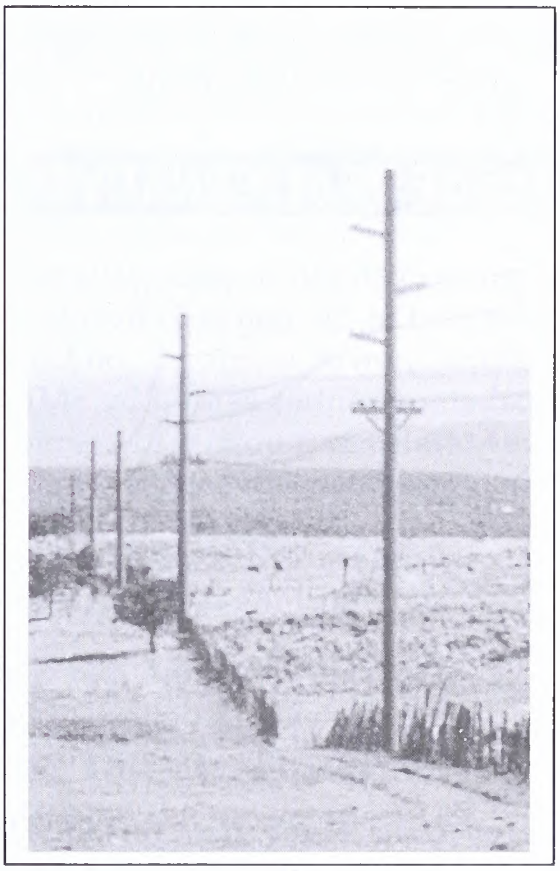
Proposed 115 kV Single-Circuit Line
(Single Pole Structure – Avg. Height 81 ft.)



Existing 69 kV Single Pole Structure
Nucla-Sunshine Line
(Avg. Height 34 ft.)



Simulation of Proposed 115 kV
Single-Circuit Line
(H-frame Structure – Avg. Height 80 ft.)



Simulation of Typical 115 kV Single Pole
Structure with Distribution Underbuilt
(Avg. Height 87 ft.)

Figure SUMMARY-2
Representative Transmission Pole Designs

The replacement of the 69 kV line with a 115 kV line would also require a number of modifications to SMPA substations and distribution lines. The Norwood Substation, a necessary interconnection for all routing options, would need to be enlarged to approximately 2 acres. Only minor changes would be required at the Nucla, Sunshine, Wilson Mesa and Specie Mesa Substations. The Oak Hill Substation would be removed. Changes to the distribution system would entail extending, replacing or relocating small sections of distribution lines.

PUBLIC SCOPING PROCESS AND ISSUES

In accordance with the requirements of NEPA, the Forest Service held a number of public scoping meetings to document the issues associated with this Project, to identify feasible alternatives and to determine the scope of the EIS analysis. Workshops and meetings were noticed and held on February 24, 25, March 19, May 26, 27, 28 and August 19, 1998. The Notice of Intent (NOI) was published in the Federal Register on April 30, 1998. The San Miguel Energy Resource Group (SMERG) also provided input into this process in 1999 through their work for the San Miguel County Commissioners regarding energy options for the Telluride Area.

Major issues raised during this process included alternative routing options, alternative designs such as undergrounding the line or rebuilding it as a 69 kV line; and alternative technologies, such as distributed generation (DG) and hydroelectric options. Environmental and social issues that were raised during scoping included avoiding or minimizing effects to a variety of sensitive resources, among others - impacts to natural scenery, biologically sensitive areas, residential and recreation areas, and areas susceptible to unstable conditions due to soils, geology, or avalanche hazards. Scoping issues are summarized in Chapter 1.0 of the draft EIS.

RANGE OF ALTERNATIVES CONSIDERED IN THE EIS

A range of feasible alternatives was identified through the scoping process. Alternatives evaluated in the Nucla-Telluride draft EIS respond to Tri-State's stated need for alleviating regional power overload conditions and improving power reliability and service in the local communities served by SMPA and other cooperative members. The range of alternatives is also responsive to public scoping comments regarding environmental and social issues and alternative energy options. The types of alternatives considered are:

- *Primary Transmission Line Routing Alternatives* - between the Nucla, Norwood and Sunshine or Telluride Substations;
- *Transmission Line and Substation Subalternatives*. These include minor routing adjustments, an alternative site for the Norwood Substation, and an Underground Subalternative across portions of Specie, Wilson and Sunshine Mesas;
- *Distributed Generation Alternatives* to the 115 kV Transmission Line proposal; including three scenarios that meet Tri-State's purpose and need to varying degrees;
- *the No Action Alternative,* that would entail the federal agencies not issuing permits for Tri-State's Proposed Action

PRIMARY TRANSMISSION LINE ROUTING ALTERNATIVES

The draft EIS analyzes three primary action alternatives between the Nucla and Norwood Substations and two primary action alternatives between Norwood and the project termination point, at either the Telluride or Sunshine Substation. Total routing alternatives would be achieved by combining any of the Nucla-Norwood Alternatives with either the Norwood-Sunshine or Norwood-Telluride Alternative. *Figure SUMMARY-1* shows the geographic location of these action alternatives. Each of the action alternatives would result in a range of impacts and addresses the scoping issues with varying degrees of success. The alternatives were identified by considering the regional constraints and opportunities of the project area and Tri-State's electrical system requirements. The primary alternatives consist of the following electrical system and corridor location options:

The Nucla-Norwood Northern Alternative would consist of rebuilding the existing 69 kV line to 115 kV in its current location between these two substations. This alternative primarily crosses through agricultural lands of Montrose and San Miguel Counties and traverses the community of Redvale.

The Nucla-Norwood Central Alternative would entail locating the 115 kV line parallel to Tri-State's Nucla-Cahone 115 kV line for approximately six miles, and paralleling the San Miguel and Montrose County boundary for approximately 9.7 miles. This alternative would avoid most agricultural lands in Montrose County, run parallel to the north rim of Naturita Canyon, and cross BLM lands for several miles. The Central Alternative would also entail rebuilding a section of the 69 kV line to 115 kV north and west of Norwood, where agricultural lands and the Norwood Gardens Subdivision would be crossed in San Miguel County.

The Nucla-Norwood Southern Alternative would also parallel the Nucla-Cahone 115 kV line and the Montrose/San Miguel County boundary for six miles, before traversing southeast across BLM and private lands of San Miguel County. This alternative would avoid most irrigated agriculture by following existing seismic exploration lines across BLM lands and crossing a central section of Naturita Canyon. Similar to the Northern and Central Alternatives, the Southern Alternative would cross through some agricultural lands near the Norwood Substation.

The Norwood-Sunshine Alternative would entail rebuilding the existing 69 kV line to 115 kV in its current location. This alternative would cross open meadows and mesas of San Miguel County, as well as a number of canyons including Beaver Creek, Saltado Creek, Specie Creek, Fall Creek and the South Fork of the San Miguel River. Lands crossed by this alternative are primarily private lands in San Miguel County, although some BLM and Forest Service lands would also be affected. This alternative crosses the southern part of Ilium Valley, approximately 0.5 mile north of the Ames Power Plant.

The Norwood-Telluride Alternative consists of rebuilding the existing 69 kV line to 115 kV across Beaver and Specie Mesas before establishing a new utility corridor across the slopes and benches of the San Miguel River Canyon. This alternative would cross a combination of BLM and private lands, as well as Forest Service lands near the Telluride Substation. Canyons crossed by this alternative include Beaver Creek, Saltado Creek, Specie Creek, Fall Creek, Bear Creek, the San Miguel River Canyon, Bilk Creek, and the South Fork of the San Miguel River. The Norwood-Telluride Alternative crosses the northern end of Ilium Valley, near the Mary E. Day Use Area.

TRANSMISSION LINE AND SUBSTATION ALTERNATIVES

Overhead Transmission Routing Subalternatives A, B, C, D, and E A number of subalternatives are also evaluated in the EIS. These are minor routing variations or substation site changes that are being considered. Most subalternatives were identified in response to public comments and concerns, and include various routing options near the Norwood Substation, among others. The general vicinity of the Subalternatives is shown in ***Figure SUMMARY-1.*** Subalternative A is an alternative routing across Naturita Canyon for the Nucla-Norwood Southern Alternative; Subalternatives B, C, and D are minor routing alternatives to portions of the Norwood-Sunshine and Norwood-Telluride Alternatives that pass through sensitive residential and agricultural areas. Subalternative E applies only to the Norwood-Telluride Alternative, and provides an alternative that would avoid two crossings of the San Juan Skyway National Scenic Byway by staying closer to the San Miguel River.

Underground Subalternative During scoping the public suggested undergrounding the line as a way to avoid visual impacts to scenic areas of San Miguel County. Although undergrounding of transmission lines is considered technically feasible and is often done in urban environments, this technology is not considered feasible nor practical for the entire length of the Project due to the mountainous and steep canyon terrain that must be crossed. Tri-State has a policy regarding undergrounding the line that states that landowners must absorb the difference in costs between overhead and underground construction. Undergrounding costs are typically 7 to 10 times the costs of overhead construction.

The draft EIS evaluates undergrounding, as a subalternative across scenic areas of Specie, Wilson and Sunshine Mesas. In these locales, undergrounding is considered technically feasible. Since these lands are privately owned rather than public lands, the EIS analysis is limited to disclosing the major environmental and cost tradeoffs for purposes of public disclosure. San Miguel County will be the primary agency responsible for permitting the Project across private lands in the county. The Forest Service and BLM have no decision-making authority for this subalternative and have no position regarding Tri-State's underground policy. RUS has reviewed Tri-State's policy concerning undergrounding transmission facilities and found it to be a reasonable and prudent policy.

Norwood Substation Alternative Site B This subalternative considers an alternate site for locating an enlarged Norwood Substation.

DISTRIBUTED GENERATION (DG) ALTERNATIVES

In response to public scoping comments and a report prepared by Competitive Utility Strategies (CUS) for SMERG in 1999, the draft EIS considers three distributed generation alternatives to Tri-State's proposed 115 kV Project. Distributed generation options have been suggested by SMERG as a way to avoid impacting sensitive lands of San Miguel County. In early 2000, the Forest Service retained an independent engineering firm, Alternative Energy Systems Consulting, Inc. (AESC) to review the CUS report and develop reasonable alternatives for consideration in the EIS. In developing the distributed generation alternatives, the Forest Service directed AESC to consider how this type of technology could best meet the stated purpose and need for improving power reliability and service, while also alleviating regional system overloads. The three generation alternatives differ in the size and type of generators, and the degree to which they could meet the project purpose and need. These alternatives would also require other electrical and natural gas system changes, including natural gas pipeline interconnections and rebuilding portions of the 69 kV Nucla-Sunshine line to a present-day 69 kV standard. The generation alternatives include:

A Large Generator Alternative would provide power capacity that could be used for regional and local needs. A GE Frame 6B natural gas turbine generator is assumed for this analysis and would have a rated winter capacity of 33 MW ***(Figure SUMMARY-3).*** The generator would require a site approximately 1.5 acres in size, as well as extensions of the existing Kinder-Morgan natural gas pipeline and a compressor station near Redvale. Under this scenario, the removal of the existing 69 kV line between the Norwood and Sunshine Substations is considered technically feasible, although SMPA has indicated that they would retain the line for distribution service (Tri-State and SMPA 2000e). Among the generation scenarios, the Large Generator Alternative would best meet the stated purpose and need set forth in Chapter 1.0 and assumes that the 13 MW of power currently provided by the Nucla-Sunshine 69 kV line would not be available in the future.

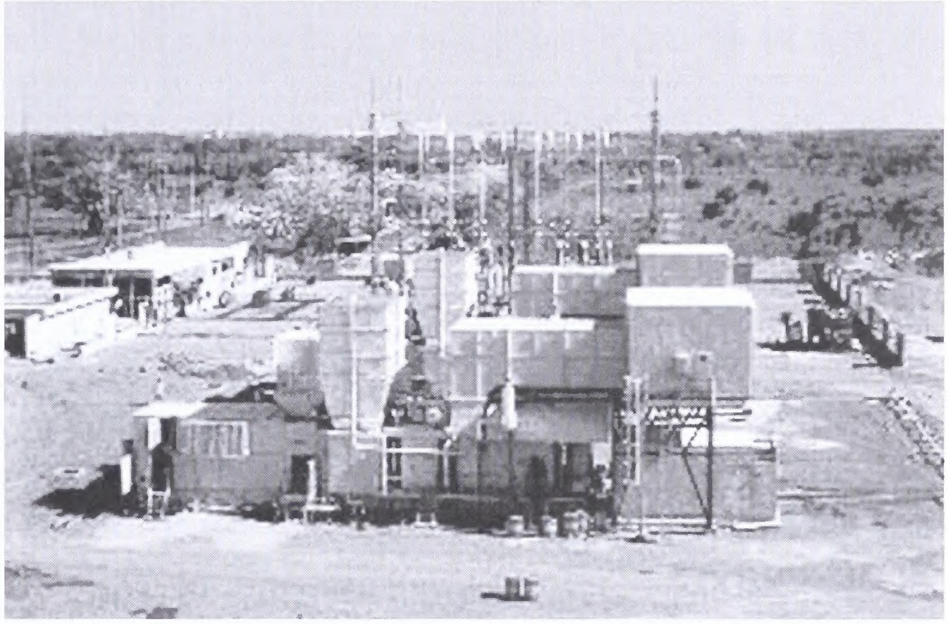


Figure SUMMARY-3
External Picture of Two Installed GE Frame 6B Gas Turbines

A Small Generator Alternative would meet the stated purpose and need for increased power reliability in southwestern Colorado and regional power transfer capability, although to a lesser degree than the proposed transmission project. The Small Generator Alternative assumes the installation of two Solar Titan 130 natural gas turbines with a combined capacity of 20 MW (***Figure SUMMARY-4*** *shows a compressor station similar in size*). The generators would require a site approximately 1.0 acre in size, as well as extensions of the existing Kinder-Morgan natural gas pipeline and a compressor station near Redvale. Under this scenario, the existing Nucla-Sunshine 69 kV line is assumed to remain in place and be rebuilt by SMPA over time to meet the reliability needs of its customers and financing requirements of RUS. As such, the 13 MW of power currently provided by the Nucla-Sunshine 69 kV line would continue to be available.

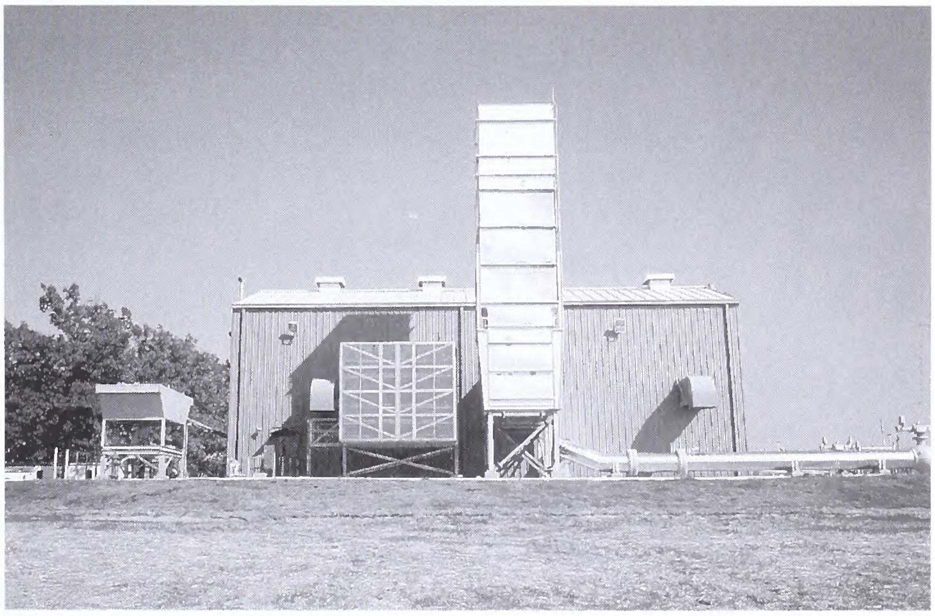


Figure SUMMARY-4
Representative Scale of a Solar Titan 130 Gas Turbine Generator

Emergency Backup Generator Alternative Under this scenario, the distributed generator would be sized and available only to provide backup power to Telluride during an emergency outage. This scenario would not meet the other stated purposes and needs for the Project as set forth in Chapter 1.0. Similar to the Small Generator Alternative, this alternative assumes that the 13 MW of power currently available from the 69 kV line would continue to be available in the future. The Emergency Generator Alternative assumes the installation of two Solar Titan 130 natural gas turbines with a combined capacity of 20 MW *(Figure SUMMARY-4)*. The generators would require a site approximately 1.0 acre in size, as well as extensions of the existing Kinder-Morgan natural gas pipeline and a compressor station near Redvale. Under this scenario, the existing Nucla-Sunshine 69 kV line is assumed to remain in place and be rebuilt by SMPA over time to meet the reliability needs of its customers and financing requirements of RUS.

At the direction of the Forest Service, AESC identified four feasible sites for these generator alternatives near the Telluride Substation and in Ilium Valley. ***Figure SUMMARY-5*** shows the general locale where feasible sites were identified. The purpose of this preliminary siting effort was to determine whether sites of sufficient size exist— not to identify a specific preferred site. Consequently, similar to the underground subalternative, the purpose of the EIS analysis is to provide the public a disclosure of the major environmental, cost and technical issues associated with this type of technology.

The Forest Service would not be the primary decision-making agency for this type of alternative. The permitting of a generation alternative on private land would primarily be the responsibility of San Miguel County and state agencies. It is also important to note that Tri-State has indicated they would not propose nor develop this type of energy alternative.

NO ACTION ALTERNATIVE

The No Action Alternative means that no permits would be issued on public lands by the Forest Service or other federal agencies for the Project. Under this scenario, it is assumed that SMPA would continue to perform routine maintenance on the existing 69 kV line. Power reliability would continue to lessen, however, and human health and safety risks and economic impacts associated with more frequent and longer outages would be expected to occur at some point in the future.

ALTERNATIVES CONSIDERED AND ELIMINATED FROM STUDY

A number of alternatives that were considered by the agencies early-on or suggested by the public during scoping were not carried forward for analysis in the EIS. The range of suggested alternatives included routing variations, alternative voltages (e.g. 69 kV rebuild) and alternative energy technologies. Routing alternatives were eliminated if the environmental and social effects of relocating the line would be greater than rebuilding it in its current location. As a sole alternative between Nucla and Sunshine Substations, the 69 kV voltage alternative was eliminated since the land use and visual effects would be very similar to the proposed 115 kV and this voltage line would not meet the purpose and need to the extent possible with the 115 kV system. Alternative technology options considered and eliminated included hydroelectric, solar and wind. These technologies were eliminated due to a number of cost, environmental and technology development factors. Chapter 2.0 of the draft EIS discusses the rationale for eliminating various alternatives suggested during scoping.

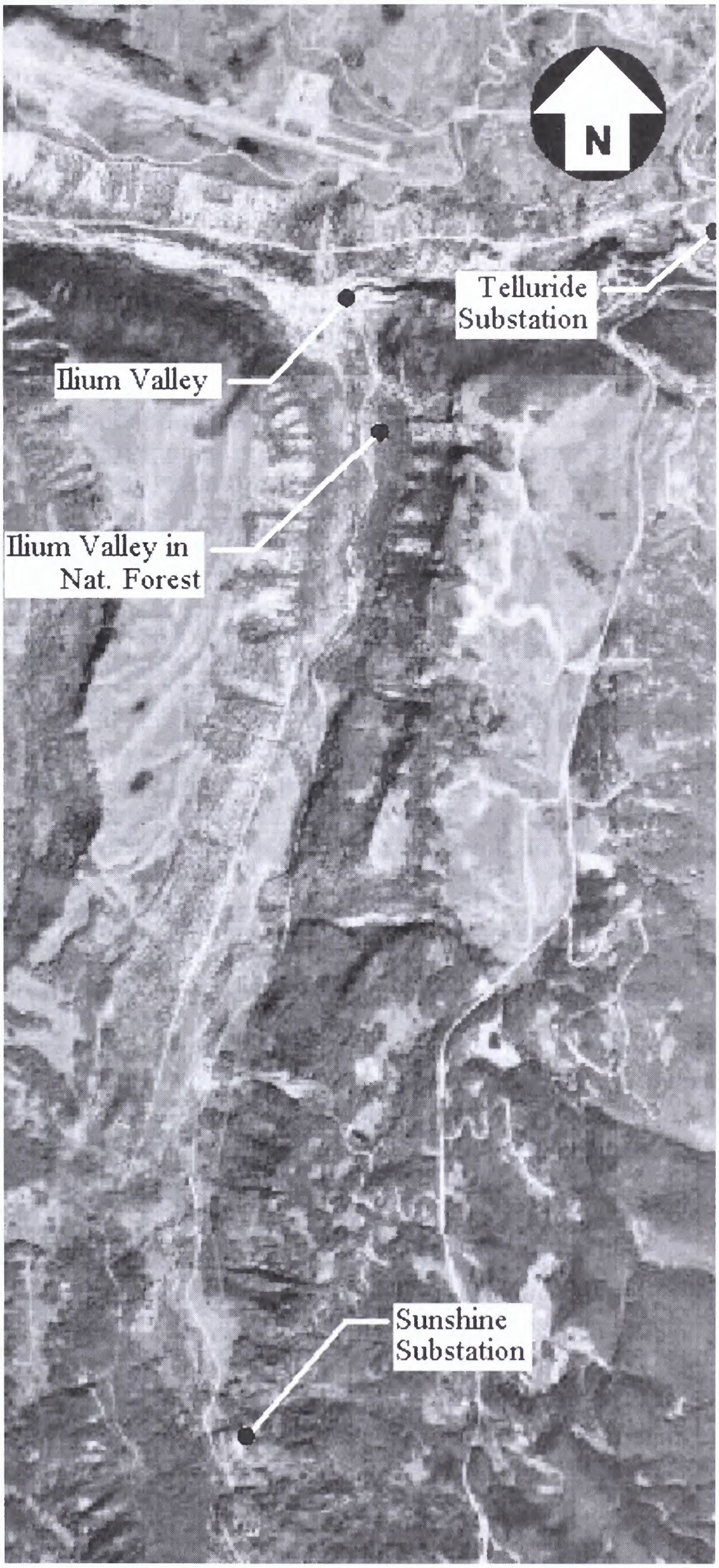


Figure SUMMARY-5
Possible Generator Sites

SUMMARY OF FINDINGS

COMPARISON OF TRANSMISSION ALTERNATIVES

The major issues of the transmission alternatives are summarized below according to routing options between the Nucla and Norwood Substations, and routing alternatives between Norwood and either the Sunshine or Telluride Substations. In general, the summary discussions focus on long-term visual and land use-related impacts. Impacts to the natural, biological, and cultural environments would be short-term and/or substantially mitigated or avoided through Environmental Protection Measures (EPMs) proposed by Tri-State or required by federal agencies.

Supporting the narrative are *Tables S-1* and *S-2* at the back of this summary. The summary tables address the type and magnitude of effects the transmission alternatives would have on the following environmental and social topics: air quality, geologic conditions and paleontological resources, soils, water resources, biological resources, cultural resources, existing and planned land uses, recreation, socioeconomics and property values, traffic and transportation, noise, and human health and safety.

These tables compare impacts according to the qualitative criteria and quantitative measurements reported in the draft EIS. Impacts have been documented qualitatively according to three impact levels: high, moderate and low. These qualitative levels are defined for each of the resource topics in draft EIS Chapter 3.0 and are used to reflect professional judgments regarding the severity of effects that each alternative would cause. Quantitative impact findings are based upon the natural, social and cultural resources encountered along each corridor alignment or centerline. The alignments, or centerlines, are hypothetical right-of-way locations for the Project within each corridor. These alignments represent likely locations for the Project based upon Tri-State's preliminary engineering and right-of-way studies. These alignments have been used in the EIS for analysis and comparison of alternatives. Each alignment section is identified with a ‘link’ number for ease of locational referencing. For purposes of the EIS analysis, the impact assessment assumes a 100-foot-wide right-of-way in all instances.

Impacts shown on *Tables S-1* and *S-2* represent ‘worst-case’ effects before mitigation measures are applied. Applicant committed Environmental Protection Measures (EPMs) are assumed as presented in the draft EIS, Chapter 2.0, *Tables 2.2-4* and *2.2-5*. Potential measures that would further reduce environmental effects are provided in Chapter 3.0 by resource topic. Mitigation measures presented in Chapter 3.0 are potential measures only, and do not represent commitments on the part of the applicants, or federal lead and cooperating agencies. The degree to which these measures may be adopted for the Project will be determined by the Forest Service, BLM and RUS in their respective Records of Decision (RODs), and by Montrose and San Miguel Counties through their respective Special Use Permit application processes. The residual effects summarized below reflect the types and degrees of impacts that would remain after potential mitigation measures are applied to the various alternatives.

It should be noted that Tri-State has not identified any final rights-of-way and, as such, the project's final location within the corridors may vary from the alignments considered in this EIS. Assumptions used in estimating quantified effects of the alternatives are contained in Chapter 2.0 of the draft EIS.

MAJOR ISSUES ASSOCIATED WITH NUCLA-NORWOOD ALTERNATIVES

The routing alternatives between the Nucla and Norwood Substations would cross portions of Montrose and San Miguel Counties and affect both privately-owned and public lands administered by the Bureau of Land Management. *Figure SUMMARY-1* shows the general vicinity of these alternatives. Reference should be made to the draft EIS *Plate PROJECT-2* for detailed locations and link identifications.

IMPACTS COMMON TO ALL ALTERNATIVES

The EIS concludes that the following types of impacts would occur, regardless of the alternative selected:

- The Norwood Substation would be expanded or relocated. Visual and land use impacts would occur to residents of Norwood. During construction, increased traffic, noise and dust would occur from construction activities, equipment and vehicles.
- The proposed transmission line would require a right-of-way 75 to 100 feet in width that would restrict public and private land use options within the right-of-way.
- Residents of Montrose and San Miguel Counties would be affected visually by the increased height of the proposed 115 kV poles (average height 80 feet), compared to the existing 69 kV line (average height 35 to 40 feet). Increased visibility of the conductors would occur as well due to the pole height increase.
- All the alternatives would result in short-term land disturbances during construction. Construction equipment and activities would increase noise, dust and traffic during the construction period. Disturbances to soils, vegetation communities and wildlife habitat, wetlands and water resources would also occur.

NUCLA-NORWOOD NORTHERN ALTERNATIVE

The Nucla-Norwood Northern Alternative (links 0, 1 and 3) would be the shortest route – 16.5 miles. This alternative would entail replacing the existing 69 kV line with a new 115 kV line in the same location. Tri-State would use existing roads and overland construction methods. The vast majority of the existing 69 kV line crosses portions of Montrose and San Miguel Counties that are used for agricultural, grazing and rural lifestyle purposes. The most developed areas crossed by the Northern Alternative are through the community of Redvale and the Norwood Gardens Subdivision. Minor reroutes would likely be required in these areas and others, where adequate right-of-way clearances necessary for a 115 kV line do not presently exist. Total ground disturbance from construction is estimated to be 111 acres. Single poles would be used for the vast majority of this route.

Land Use and Private Landowner Conflicts Areas where existing land uses and structures are incompatible with right-of-way clearance requirements for 115 kV lines include the town of Redvale, the Norwood Gardens Subdivision and scattered rural residential areas of San Miguel County near the Norwood Substation. The existing 69 kV line also crosses and bisects numerous private lands that are used for ranching and agricultural related uses. The line crosses approximately 4 miles of prime farmland. Approximately 26 homes and 34 lots are within 300 feet of the alignment. Existing uses and future land use development options could be affected, depending upon individual landowner and easement conditions. Land use conflicts are considered long-term and adverse. Right-of-way adjustments could avoid most, if not all, direct conflicts with the utility easement restrictions.

Visual Impacts The increased height of the 115 kV poles would be noticeably visible within the open agricultural valleys and from a number of rural residential settings. Visual impacts are considered adverse, but not significant, since the visual character of the built landscape has features of similar scale and line, such as other utility poles, fences, and agricultural structures. Visual impacts in natural settings would be greater due to the lack of similar land use developments. Approximately 166 residences are within a foreground viewing distance zone (0.5 mile from the corridor centerline). This alternative would also have long-term impacts on the quality of views seen from the Unaweep-Tabeguache Scenic Byway (SR 141) for 17 miles.

Natural and Biological Environmental Issues - Geology, Slope Stability, Wetlands, and Sensitive Wildlife Issues that would need to be addressed in engineering design and construction include avoidance of steep slopes and areas of slope instability, numerous wetland and water resources, and sensitive habitats and breeding periods for riparian dependent wildlife species, southwestern willow flycatcher and bald eagles. With careful design and pole placements, most, if not all, natural resource constraints could be avoided or substantially minimized.

NUCLA-NORWOOD CENTRAL ALTERNATIVE

The Nucla-Norwood Central Alternative (links 0, 2, 3, 4 and 5) would be 19.5 miles long. The alternative would entail crossing BLM lands for 4.2 miles, mainly south of the Nucla Substation, before turning eastward and paralleling the Montrose/San Miguel County line for 9.7 miles. The alternative also parallels the north rim of Naturita Canyon along the county line and at the edge of rural developments. The Central Alternative would avoid the community of Redvale, but would cross the Norwood Gardens Subdivision, northwest of Norwood. Tri-State would use and improve existing roads for construction access. Helicopter construction would be used at the Naturita Canyon crossing. This alternative would affect both developed agriculture and grazing lands, as well as natural landscapes supporting pinyon-juniper vegetation. With the Central Alternative, the existing 69 kV line would be removed or converted to a distribution line. Total ground disturbance from construction is estimated to be 183 acres. Pole types would include H-frame, single pole, and three-pole structures.

Land Use and Private Landowner Conflicts Areas where existing land uses and structures are incompatible with right-of-way clearance requirements for 115 kV lines include the Norwood Gardens Subdivision and scattered rural residential areas of San Miguel County near the Norwood Substation. The existing 69 kV line also crosses and bisects numerous private lands that are used for ranching and agricultural related uses, including 1.0 mile of prime farmland. Approximately 7 homes and 16 lots are within 300 feet of the alignment. Existing uses and future land use development options could be affected, depending upon individual landowner and easement conditions. Land use conflicts are considered long-term and adverse. Right-of-way adjustments avoid most, if not all, physical conflicts with utility easement restrictions.

Visual Impacts The increased height of the 115 kV poles would be noticeably visible within the open agricultural valleys, from a number of rural residential settings, and as seen along the north rim of Naturita Canyon. Visual impacts are considered adverse, but not significant, since the visual character of the built landscape has features of similar scale and line, including utility poles, fences, and agricultural structures. Visual impacts in natural settings would be greater due to the lack of similar land use developments. Approximately 102 residences are within a foreground viewing distance zone (0.5 mile from the corridor centerline). This alternative would also have long-term impacts on the quality of views seen from the Unaweep-Tabeguache Scenic Byway (SR 141) for 6.5 miles.

Natural and Biological Environmental Issues - Geology, Slope Stability, Wetlands, and Sensitive Wildlife Issues that would need to be addressed in engineering design and construction include avoidance of steep slopes and areas of slope instability, numerous wetland and water resources, and sensitive habitats and breeding periods for riparian dependent wildlife species, southwestern willow flycatcher and bald eagles, among others. With careful design and pole placements, most natural resource constraints could be avoided or substantially minimized.

NUCLA-NORWOOD SOUTHERN ALTERNATIVE

The Nucla-Norwood Southern Alternative (links 0, 4, 6, 7 and 8) would be 18.2 miles long. The alternative would entail crossing BLM lands for 8.5 miles and private lands for 9.7 miles. This alternative maximizes the use of public BLM lands and would enlarge seismic exploration lines (approximately 5 feet wide) to 14 feet wide for access roads along much of the alternative. Helicopter construction would be used at the crossing of Naturita Canyon. The Southern Alternative would avoid the community of Redvale and Norwood Gardens Subdivision. This alternative would primarily affect undeveloped public lands supporting pinyon-juniper vegetation. Rural agricultural areas would also be affected west of the Norwood Substation. Similar to the Central Alternative, the existing 69 kV line would be removed or converted to a distribution line. Total ground disturbance from construction is estimated to be 192 acres. Poles would primarily be H-frame on public lands and single poles on private lands.

Land Use and Private Landowner Conflicts The Nucla-Norwood Southern Alternative would affect public lands with dispersed recreational values and private rural residential and agricultural lands west of the Norwood Substation. This alternative crosses a central section of Naturita Canyon that is in a natural undeveloped state and is valued by local residents for open space and a variety of dispersed and passive recreational pursuits. Approximately 8 homes and 2 undeveloped lots are within 300 feet of the alignment. Existing uses and future land use development options could be affected, depending upon individual landowner and easement conditions. Land use conflicts are considered long-term and adverse. Right-of-way adjustments could avoid most, if not all, physical conflicts with utility easement restrictions.

Visual Impacts Visual impacts to Naturita Canyon would be high due to the degree of landscape character change that the 80-foot tall poles, conductors and marker balls would create. Long views of the conductor spans and marker balls would occur impacting the natural setting of the canyon. Visual impacts in most other agricultural and rural residential areas are considered adverse, since the visual character of the built landscape has features of similar scale and line, such as other utility poles, fences, and agricultural structures. Approximately 50 residences are within a foreground viewing distance zone (0.5 mile from the corridor centerline).

Natural and Biological Environmental Issues - Geology, Slope Stability, Wetlands, and Sensitive Wildlife Issues associated with the Southern Alternative include potential direct impacts to riparian dependent wildlife species and bald eagles. Indirect impacts to sensitive wildlife species could result from increased access, as well as construction-related disturbances. Geotechnical issues include construction on steep slopes and areas of slope instability, avoidance of wetlands and water resources. With careful pole placements, most impacts to natural resources could be minimized or avoided.

NUCLA-NORWOOD SUBALTERNATIVES

Subalternative A is a routing variation across Naturita Canyon that could be used instead of the canyon crossing evaluated in the Southern Alternative. Subalternative A would route the 115 kV line down into the canyon, rather than spanning the canyon rim to rim. This subalternative was evaluated in response to public concerns regarding potential impacts to the natural qualities of the canyon that the 115 kV poles, conductors and marker balls would create. Subalternative A would avoid the strong visual contrasts created by the conductors and marker balls, however, the conductors would still be highly visible under certain lighting conditions. This subalternative would also have the potential to impact natural qualities in the canyon, including riparian vegetation and sensitive wildlife species.

Norwood Substation Alternative Site B would consist of constructing a new and larger, approximately 2-acre, substation southeast of the existing Norwood Substation. With this subalternative, the existing Norwood Substation would be dismantled and restored to a natural setting. This subalternative would reduce the visual effects of expanding the substation at its current location, near the town of Norwood. The subalternative would also reduce potential land use conflicts that are associated with multiple lines connecting to the substation facility.

MAJOR ISSUES ASSOCIATED WITH NORWOOD-TELLURIDE AND NORWOOD-SUNSHINE ALTERNATIVES

The routing alternatives between the Norwood and Telluride or Sunshine Substations would cross portions of San Miguel County and affect both privately-owned and public lands administered by the BLM and the Forest Service. These two routing alternatives are the same for the first 16.6 miles (links 9, 10, 11, 12 and 13) and follow the existing 69 kV line location. The Norwood-Sunshine line would continue to follow the existing 69 kV alignment across portions of Wilson Mesa, Sunshine Mesa and Ilium Valley to the Sunshine Substation. In comparison, the Norwood-Telluride Alternative would establish a new utility corridor along portions of the south rim of the San Miguel River Canyon and terminate at the Telluride Substation. This alignment utilizes public lands administered by the BLM and Forest Service to the extent feasible.

IMPACTS COMMON TO BOTH ALTERNATIVES

The environmental impacts of these two routing options would be identical for the first 16.6 miles where these alignments are the same. This includes the short-term construction and long-term operational impacts of the Project extending eastward from the Norwood Substation across portions of Wrights Mesa, Beaver Creek, Beaver Mesa, Specie Creek and Specie Mesa.

Common impacts of these alternatives would consist of the following:

- The proposed transmission line would require a right-of-way 75 to 100 feet in width that would restrict public and private land use options within the right-of-way. Residential areas on Wrights Mesa that would be directly affected include the Fitts Subdivision, east of the Norwood Substation. The proposed line would be underbuilt with distribution service through this residential area.

- Private lands used primarily for ranching, residential or recreational uses would be directly impacted by the project right-of-way on Beaver Mesa and Specie Mesa, including lands within the Peninsula, Specie Mesa Ranch and Top of the World Subdivision. Impacts to land values could occur in instances where the Project interferes with scenic views to the San Juan Mountains.

- Residents and visitors of San Miguel County would be affected visually by the increased height of the proposed 115 kV poles (average height 80 feet), compared to the existing 69 kV line (average height 35 to 40 feet). Increased visibility of the conductors would occur as well due to the pole height increase. Subdivisions with scenic views to the San Juan Mountains would be affected, including views from Specie Mesa Ranch, Top of the World Subdivision, and the Peninsula.

- Both alternatives would result in short-term land disturbances during construction. Construction equipment and activities would increase noise, dust and traffic for the short period of construction.
- Both alternatives would cross the San Miguel River Canyon Area of Critical Environmental Concern (ACEC). The crossing of the ACEC would occur along the existing 69 kV utility corridor and would be in compliance with the BLM's management plan.

NORWOOD-SUNSHINE ALTERNATIVE

The Norwood-Sunshine Alternative (links 9, 10, 11, 12, 13, 14, and 15) is 28.3 miles long, crossing private lands in San Miguel County for 25.5 miles, Colorado State lands for 0.6 mile, BLM public lands for 1.1 miles and National Forest lands for 1.1 miles. This alternative would entail rebuilding the existing 69 kV line to 115 kV in its current location. Construction practices would include using or improving existing roads, employing overland construction techniques and vehicles in areas of low vegetation cover, and using helicopter construction methods at canyon and river crossings. Total ground disturbance from construction is estimated to be 174 acres. Structures would primarily consist of single poles on private lands and H-frame wood structures on public lands.

Land Use and Private Landowner Conflicts Rebuilding the existing 69 kV line to 115 kV would cause increased impacts to private lands due to the wider right-of-way that would be required. In addition to the impacts common to both alternatives, this alternative would cross private lands on Wilson and Sunshine Mesa, and directly impact private ranches and lots within the Wilson Mesa Subdivision, and Ptarmigan Ranch. In total, approximately 10 homes are within 300 feet of the alignment, as well as a number of undeveloped lots on Specie, Wilson and Sunshine Mesas. Existing uses and future land use development options could be affected, depending upon individual landowner and easement conditions. Land use conflicts are considered long-term and adverse. Due to the scenic values associated with private lands on these mesas, this alternative has the potential to impact land values in instances where the proposed 115 kV line would directly conflict with scenic views.

Visual Impacts The Norwood-Sunshine Alternative would primarily impact scenic views from private homes and lots on Specie, Wilson and Sunshine Mesas. Developed agricultural settings on Wrights Mesa could also be adversely affected. Approximately 92 residences are within a foreground viewing distance (0.5-mile) of the alignment. The Faraway Ranch private recreation area would also be visually affected by this alternative. Significant visual impacts to residential settings and areas used for dispersed recreation could also occur up to 2 plus miles from the alignment due to the increased size and scale of the 115 kV transmission line. Visual impacts would vary depending upon specific viewing conditions to the San Juan Mountains and the degree to which the powerline would interfere with those views. The increased height of the proposed 115 kV poles combined with the increased visibility of the elevated conductors could result in increased visual contrasts with the natural setting and scenic views to the San Juan Mountains. Long-term visual impacts are assessed as high to moderate, depending on individual setting conditions.

Natural and Biological Environmental Issues – Geology, Slope Stability, Wetlands, and Sensitive Wildlife Issues associated with the Norwood-Sunshine Alternative include potential direct impacts to Mexican spotted owl habitat and boreal toads, as well as indirect impacts to habitats suitable for Gunnison sage grouse, southwestern willow flycatcher, and riparian dependent wildlife species. Geotechnical issues include construction on steep slopes and areas of slope instability, avoidance of wetlands and water resources. With careful pole placements, most impacts to natural resources could be minimized or avoided.

NORWOOD-TELLURIDE ALTERNATIVE

The Norwood-Telluride Alternative (links 9, 10, 11, 12, 13, 19, 20 and 21) is 29.5 miles long. In addition to the impacts common to both alternatives, the Norwood-Telluride Alternative would impact private and public lands along the south rim of the San Miguel River Canyon. Construction techniques would employ ground crews and equipment in areas where access exists or where overland construction techniques and vehicles are feasible. Along the south rim of the San Miguel River Canyon, ground crews, ATV's and helicopter construction methods would be used. Total ground disturbance from construction is estimated to be 262 acres. Structure designs would primarily be single wood poles on private lands and a combination of single, H-frame and three-pole structures on public lands and steep slopes.

Land Use and Public/Private Land Management Conflicts. In addition to the impacts common to both alternatives, potential impacts from the Norwood-Telluride Alternative include direct physical impacts to the San Miguel River Canyon Special Recreation Management Area, direct physical impacts to the Galloping Goose Recreational Trail and potential direct conflicts with platted lots in the Ilium Valley Business and Industrial Park. This alternative also has the potential to impact private lands and development options due to the greater right-of-way required for the 115 kV Project. Approximately 11 residences as well as numerous undeveloped lots are within 300 feet of the alignment,

Visual Impacts The Norwood-Telluride Alternative would impact both public and private views and landscapes of high scenic quality. This alternative would impact the quality of views afforded from SR 145, the San Juan Skyway National Scenic Byway, for approximately five miles of roadway. Roadside views to the San Miguel River Canyon would be adversely affected by the visibility of poles, conductors, and right-of-way clearings through conifers and aspens on the south slopes of the canyon. The right-of-way clearing would also be visible from the Telluride Ski Area, the Last Dollar Road, County Road P.58, the Telluride Airport and residents of Aldasoro and Greyhead Ranches. In total, there are approximately 81 residences within a foreground viewing distance zone from the Project (approximately 0.5-mile). Significant visual impacts to residential settings and areas used for recreation could also occur up to 4 plus miles from the alignment, depending upon specific viewing conditions. The increased height of the proposed 115 kV poles combined with the increased visibility of the elevated conductors could result in strong visual contrasts with the natural setting and impact scenic views to the San Miguel River Canyon. Long-term visual impacts are assessed as high to moderate, depending on individual setting conditions. Views from a residential subdivision east of the South Fork Road, near the Ilium Valley Business and Industrial Park would also be adversely affected, as well as views from the Mary E. Day Use Area and Galloping Goose Trail.

Natural and Biological Environmental Issues - Geology, Slope Stability, Wetlands, and Sensitive Wildlife Biological issues associated with the Norwood-Telluride Alternative include potential direct impacts to Mexican spotted owl habitat and boreal toads, as well as indirect impacts to habitats suitable for Gunnison sage grouse, Canadian lynx, southwestern willow flycatcher, and riparian dependent wildlife species. With careful construction practices including helicopter placement of poles and timing of construction to avoid sensitive biological species breeding periods, most impacts to sensitive wildlife and riparian species could be reduced to less than significant levels.

Geotechnical and soils issues include construction on steep slopes and areas of slope instability, and potential impacts to wetlands and water resources, especially along the San Miguel River. This alternative poses significant slope stability risks and hazards from installing poles on steep mountain slopes. Special construction techniques for pole placements would be required to avoid most impacts. The location of the line on the canyon slopes, where no winter access would be possible in the event of an outage, also represents an unmitigable hazard and power reliability risk.

NORWOOD-TELLURIDE/SUNSHINE SUBALTERNATIVES

Subalternatives B and C are common to both the Norwood-Sunshine/Telluride Alternatives and are routing options around the Fitts Subdivision. Between these two options, Alternative C would minimize visual impacts to residents of the subdivision; however, other residents on larger rural parcels would be visually affected.

Subalternative D is also common to both primary routing alternatives. This minor routing adjustment would avoid impacts of bisecting agricultural lands by following field boundaries.

Subalternative E pertains to the Norwood-Telluride Alternative. This subalternative would avoid the visual impacts of crossing the National Scenic Byway twice near Ilium. Instead, Subalternative E would stay south of the San Miguel River. While visual impacts to the San Juan Skyway National Scenic Byway would be significantly reduced in this area, sensitive biological habitats and wetlands could be directly impacted instead.

The Underground Subalternative would entail undergrounding the 115 kV transmission across portions of Specie (link 13, mile marker 10.5 to 14.3), Wilson (link 14, mile marker 2.0 to 3.2; link 15 mile marker 0.0 to 1.3 and link 15 mile marker 2.0 to 5.0) and Sunshine Mesas (link 15, mile marker 5.6 to 5.9). The Specie Mesa portion of this subalternative would apply to both the Norwood-Sunshine and Norwood-Telluride Alternatives. Undergrounding segments across Wilson and Sunshine Mesa are only applicable to the Norwood-Sunshine Alternative. Tri-State's policy is that landowners must pay the increased costs of underground construction (see draft EIS, Appendix A-2). The Underground Subalternative would result in greater short-term physical disturbance of the land for installation of the cable. A trench five feet wide would be required along the entire length of the right-of-way, along with a construction corridor for vehicles and equipment. Geotechnical conditions and impacts to soils and water resources would pose moderate to severe constraints in several areas, although with proper engineering design, constraints and impacts are considered mitigable. Benefits of this subalternative include retaining or improving the visual qualities and land values across the mesas. Long-term visual impacts to scenic views from above ground poles and conductors would be avoided. This subalternative would also minimize impacts to land values and land development options. Overall, the underground subalternative would have beneficial land use and visual effects in comparison to the overhead transmission line. Greater adverse effects to soils, water resources and biological resources would occur, however, from the greater surface disturbance required for underground construction.

COMPARISON OF TRANSMISSION AND DG ALTERNATIVES

The major benefits and costs of the Distributed Generation (DG) and Transmission Alternatives have been compared based on the following criteria:

- Degree to which the alternatives meet Tri-State's purpose and need for increased regional power transfer capability across the TOT2A transmission grid and increased load serving capacity in southwestern Colorado
- Degree to which the alternatives meet the need for improved power reliability in the Telluride Area and surrounding communities in southwestern Colorado
- The range, type and scale of facilities required for each alternative
- The major environmental tradeoffs associated with the DG and Transmission Alternatives
- The cost comparison of the DG and Transmission Alternatives

Criterion: Regional Power Transfer Capability and Load Serving Capacity. All 115 kV transmission alternatives would fully meet the purpose and need for increased regional power transfer and load serving capacity. Engineering studies conducted for the draft EIS conclude that a properly designed distributed generation alternative could meet most of the purpose and need issues set forth by Tri-State. The Large DG Alternative could fully meet the regional power transfer capabilities desired, as well as provide for some increased load serving capacity in southwestern Colorado. The Small DG Alternative would meet these needs to a lesser degree, while the Emergency DG Alternative would not provide any regional benefits. *Table S-3* shows the comparison of the regional and load serving benefits of the DG alternatives with the proposed 115 kV transmission line.

Table S-3
Comparison of Regional Benefits

	TOT2A Transfer Benefit	SW Colorado Load Serving Benefit
115 kV Nucla-Telluride Line	15 MW	30 MW
Large Distributed Generator Scenario	17 MW	11 MW
Small Distributed Generator Scenario	6 MW	4 MW
Emergency Generator Scenario	0 MW	0 MW

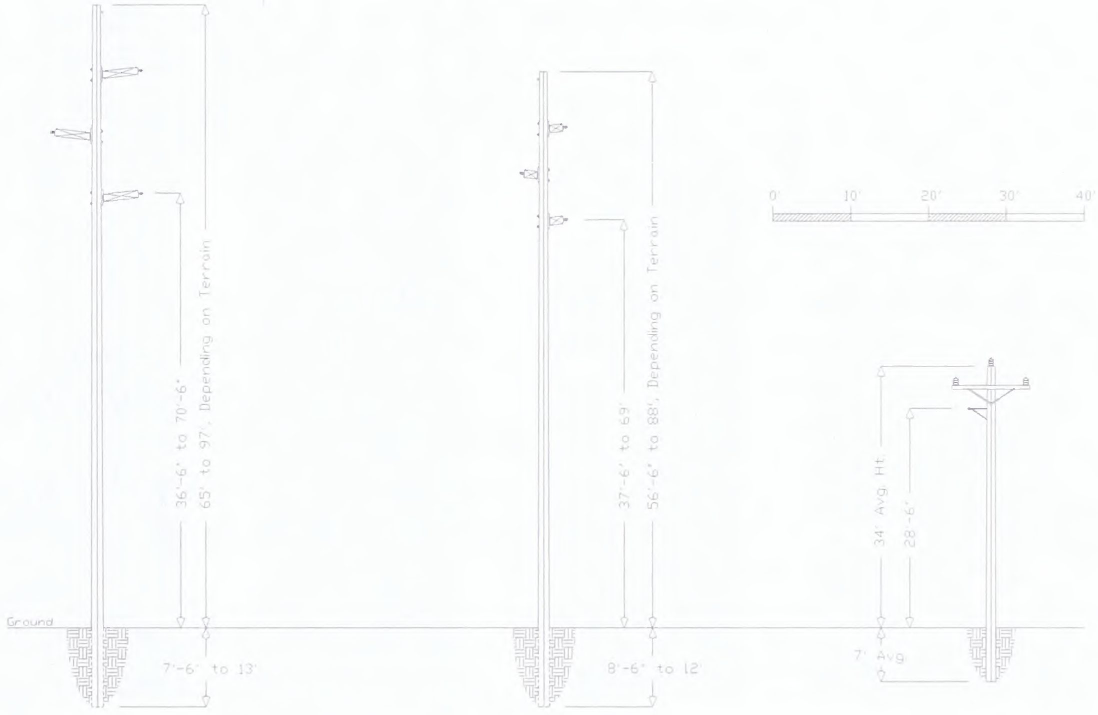
Criterion: Increased Reliability in Telluride Area and Surrounding Communities. The proposed 115 kV transmission line would provide full back-up power and improved power reliability for all communities served by the Nucla-Telluride and Telluride-Hesperus lines, including Telluride, Mountain Village, Ophir, Silverton, Purgatory and Norwood. The reliability of the 115 kV line is estimated to be more than 99%. With respect to providing increased electric power reliability to the Telluride Area, all three DG alternatives would also improve the reliability of power in the Telluride Area over what exists today. The reliability of the DG alternatives would be less than the proposed 115 kV transmission line, however, and largely depend upon the generator's readiness to operate and the probability that the unit would start when signaled. For the Small and Emergency DG Alternatives, the reliability of the system would also depend on the rebuilt Nucla-Sunshine 69kV line. Industry statistics for industrial gas turbines in the 20 to 40 MW size class have an overall reliability record of 83% to 84%. None of the DG Alternatives could provide instantaneous backup power like the proposed 115 kV transmission system, however. Short blackout periods, up to 20 minutes, would occur with the DG alternatives during an emergency outage situation.

With the Large Generator scenario, customers on Specie and Wilson Mesas could continue to experience deteriorating electric service, and residents served by the Norwood Substation would also benefit less. This alternative could entail leaving the existing 69 kV transmission line in place for up to 10 years, converting it to a distribution line or removing it if distribution service is placed underground. Outages on this line would continue to be a reliability problem until the line was rebuilt to present-day standards. Customers served by the Nucla-Norwood 69kV transmission line would be on a 'radial' line with no source of backup power in the event there is an outage.

With the Small and Emergency Generator DG Alternatives, the existing 69 kV line would be rebuilt as a present-day 69 kV system between the Nucla and Sunshine Substations. Consequently, power reliability would improve in all areas served by the existing Nucla-Sunshine line, including Telluride, Mountain Village, Specie, Wilson and Sunshine Mesas and the Norwood/Wrights Mesa area.

Criterion: Range and Type of Facilities Required. Tri-State's proposed Project would require:

- *A new 115 kV transmission line* supported on wood poles. Single, H-frame and three-pole designs would be used to support the 115 kV conductor and insulators. These poles would have an average height of 80 feet, only 10 feet taller than industry standard 69 kV structures (*see Figure SUMMARY-6*). The proposed poles would be approximately twice as tall as the existing 69 kV line.
- *Improvements to SMPA's electrical system* including expansion of the Norwood Substation, minor modifications to the Nucla, Specie, Wilson Mesa, Sunshine or Telluride Substations, dismantling of the Oak Hill Substation, and modifications to distribution lines necessary to retain service to SMPA's customers.



115 kV Single Circuit Structure
Single Wood Pole – Tangent
Avg. Height: 81 ft.

69 kV Single Circuit Structure
Single Wood Pole – Tangent
Avg. Height: 72 ft. 3 in.

Existing 69 kV Structure
Single Wood Pole – Tangent
Avg. Height: 34 ft.

Figure SUMMARY-6
Comparison of Industry Standard Structures and Existing Nucla-Sunshine 69 kV Structure

The DG Alternatives would require the following types of facilities:

- *Natural Gas Turbine Generators* - ranging in capacity from 20 to 40 MW. The size of the generator(s) depends on whether the 13 MW of power from the Nucla-Sunshine line continues to be available. A GE Frame 6B generator is assumed for the Large Generator Alternative, while two Solar Titan 130 generators are assumed for the Small and Emergency Generator Alternatives. New or refurbished turbines could be used. Feasible sites 1.0 to 1.5 acres in size would be near the Telluride or Sunshine Substations or in other areas of Ilium Valley.
- *A natural gas compressor station* (1,100 hp) near or at Redvale
- *An extension of the Kinder-Morgan 6" natural gas pipeline* to the generator site. Length and location of the pipeline extension would depend on the generator site.
- *Improvements to SMPA's electrical system* - including rebuilding all or part of the Nucla-Sunshine 69 kV line to an industry standard 69 kV system. With the Large Generator Alternative, the line would be rebuilt only between the Nucla and

Norwood Substations. The line would need to be completely rebuilt between Nucla and Sunshine for the Small and Emergency Generator Scenarios. The new 69 kV transmission line would be almost twice as tall (70 foot average pole heights) as the existing 69 kV line (35 to 45 feet tall on average) ***(Figure SUMMARY-6)***. Other minor modifications would also be necessary at SMPA's substation facilities and to portions of their distribution system.

Criterion: Major Environmental Tradeoffs. The proposed 115 kV transmission line would result in construction and operation-related impacts along the transmission corridor, at the Norwood and Sunshine or Telluride Substation sites, and where distribution lines are modified (*Tables S-1 and S-2*). The transmission alternatives would avoid, however, all impacts resulting from the DG Alternative's generation facilities, compressor station, and pipeline extension. Significant DG related impacts that would be avoided by the proposed transmission line project include increases in air emissions, visual impacts associated with the generators' stacks and inlet structures and vapor plumes; noise impacts from the generators, safety risks from ice fog; and visibility impairment impacts at Class I or II Wilderness Areas.

Major environmental issues associated with the DG Alternatives include:

- Increased air emissions from the generator(s) and compressor station, including increased amounts of NOx, SO, CO, and UHC. Impacts would vary depending upon the number of hours the generator(s) are operated annually.
- Visual impacts from a large generator or two small generators near Telluride. Generator stacks and inlet structures range from 25 feet to 50 feet in height for the small and large generator options.
- Visual impacts from the generator vapor plume during the winter. Visible vapor plumes could reach 100 feet in height.
- Safety risks from ice fog. Ice fog could affect both air and road travel conditions, given the proximity of potentially feasible sites to SR 145, South Fork Road and the Telluride Airport.
- Noise impacts from the generator(s). Noise impacts from the Large Generator scenario could exceed Colorado noise standards.
- Impaired visibility at Class I and II Wilderness Areas. Based on modeling studies conducted for the DG Alternatives, the potential for impaired visibility conditions exists at the Mount Sneffels, Big Blue and Lizard Head Class II Wilderness Areas. The Large Generator Alternative could also affect visibility conditions at La Garita and Weminuche Class I Wilderness Areas.
- Long-term visual and land use impacts associated with rebuilding the 69 kV line to a present day 69 kV system. The existing 35-40 foot tall wood poles would be replaced with poles averaging 70 feet in height. Impacts of rebuilding the 69 kV line would be very similar as reported in the draft EIS for the proposed 115 kV line.
- Short-term and long-term impacts to the natural, biological and cultural environments would also result from rebuilding the existing 69 kV line to a present-day 69 kV system. Impacts of rebuilding the 69 kV line would be very similar as reported in the draft EIS for the proposed 115 kV line.

Criterion: Cost Comparisons: A comparison of the costs associated with the DG and Transmission Alternatives is illustrated in ***Figure SUMMARY-7***. Cost estimates for the DG Alternatives reflect options of using new (Full Price) or refurbished (w/Economies) generators. Estimates for the DG Alternatives do not include the infrastructure that would be necessary (e.g. natural gas pipeline extension, compressor station). Overall, the DG Alternatives are more costly than Tri-State's proposed 115 kV transmission line project. Should portions of the proposed transmission line be undergrounded across Specie, Wilson and Sunshine Mesas, the costs of the proposed transmission line could increase $10 to $12 million dollars, with total project costs being in the range of $23.1 to $24.8 million dollars. Tri-State's undergrounding policy requires landowners to finance the difference in costs between overhead and underground technologies.

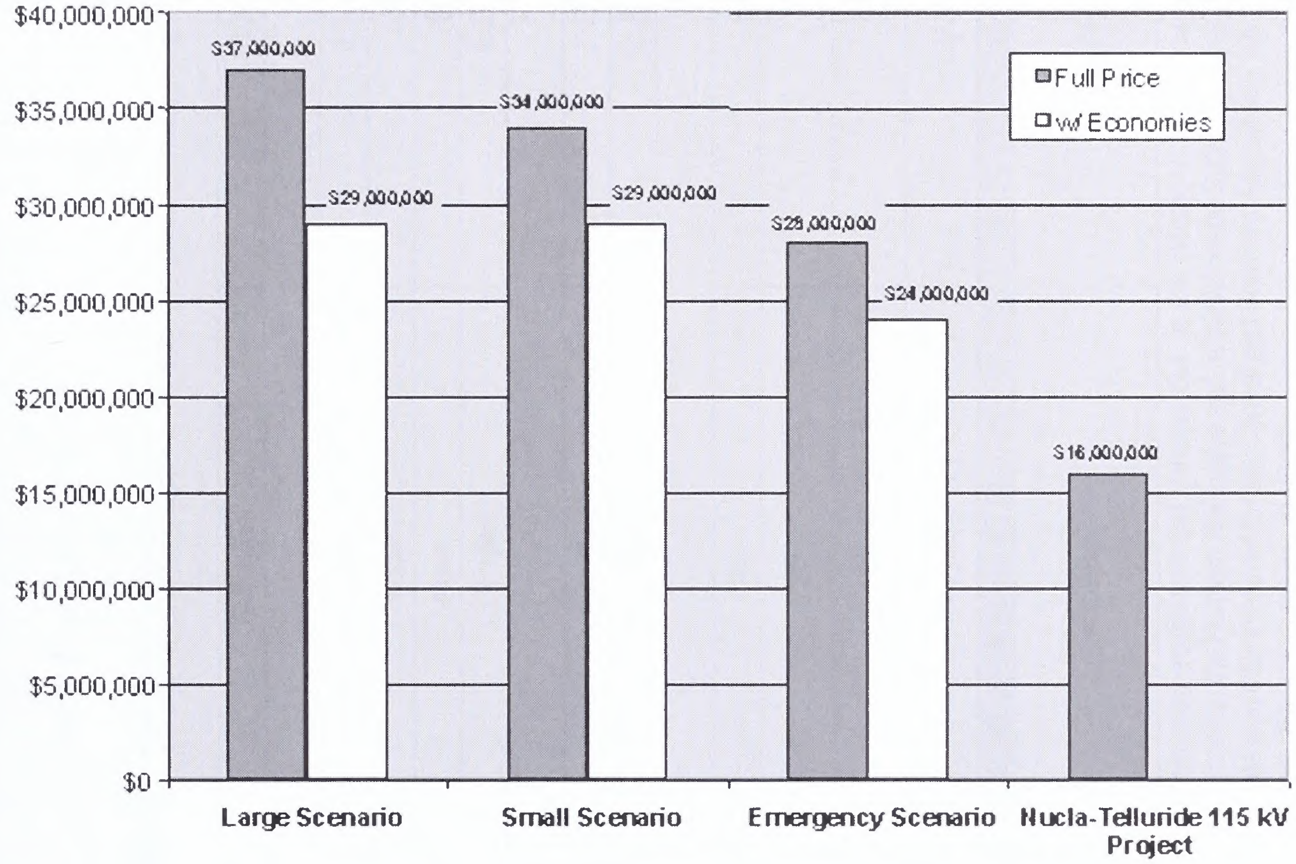


Figure SUMMARY-7
Comparison of Generator and Transmission Line Present Value Costs

ENVIRONMENTALLY PREFERRED ALTERNATIVE

The environmentally preferred alternative has been identified as consisting of the following:

(1) Constructing and operating a new 115 kV line between the Nucla Substation and the Norwood Substation, along the Nucla-Norwood Central Alternative. With this alternative, the existing 69 kV line would be removed for most of its distance through agricultural and residential areas of Montrose County, except where small sections of line would be retained for distribution service. The new line would cross undeveloped public lands administered by the BLM and private lands where land uses are considered more compatible than found along the existing 69 kV line.

(2) Constructing and operating a new 115 kV line between Norwood and Sunshine Substations. Between these substations, the environmentally preferred alternative consists of using both overhead and underground construction techniques. Undergrounding the line is environmentally preferable to overhead structures across portions of Specie, Wilson and Sunshine Mesas due to the exceptional scenic quality that would be affected by the taller overhead poles and conductors. The existing 69 kV line would be removed as part of this action alternative.

AGENCY PREFERRED ALTERNATIVE

The federal agencies' preferred alternative is a 115 kV transmission line project, located within the Nucla-Norwood Central Alternative and Norwood to Sunshine Alternative corridors. The Forest Service, BLM and RUS will issue final decisions regarding Tri-State's proposal in Records of Decisions (RODs) at the conclusion of the NEPA process, following the review of public comments on the Draft EIS and the issuance of the Final Environmental Impact Statement. Concurrent with this federal process, San Miguel and Montrose Counties will consider Tri-State's Special Use Permit applications.

Table S-1

Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	Central	Southern
Summary of Project Characteristics			
PROJECT CHARACTERISTICS:			
Length of Line:	16.5 miles	19.5 miles	18.2 miles
Jurisdiction – By Public and Private			
- Public BLM	*1.5 miles*	*4.2 miles*	*8.5 miles*
- U.S. Forest Service	*None*	*None*	*None*
- State of Colorado	*None*	*None*	*None*
- Private	*15.0 miles*	*15.3 miles*	*9.7 miles*
Jurisdiction – By County			
- Montrose County	*12.6 miles*	*15.7 miles*	*7.4 miles*
- San Miguel County	*3.9 miles*	*3.8 miles*	*10.8 miles*
Approximate No. of Poles by Type			
- Single Poles	*175*	*85*	*105*
- H-frame and 3-Pole Structures	*15*	*85*	*30*
Total No. of Pole Structures	*190*	*170*	*135*
Estimated Amount of Ground Distrubance	*110.9 acres*	*183.3 acres*	*192.4 acres*
Climate and Air Quality (EIS Section 3.2)			
Impact Findings: 115 kV Line, Substations and Distribution Lines –	*Moderate*	*Low to Moderate*	*Low to Moderate*
Summary:	Short-term impacts on air quality may result from construction equipment and vehicles due to the increased fugitive dust, hydrocarbons, carbon monoxide and nitrogen dioxide. Impacts would be greatest along the Northern Alternative and at the Norwood Substation where a number of residences are nearby. Impacts would also occur where access roads would be improved for the Central and Southern Alternatives. No high impacts would occur since effects would be short-term and no violation of air quality standards would result.		
Geology, Paleontology and Mineral Resources (EIS Section 3.3)			
Impact Findings: 115 kV Line –	***High - 1.7 miles*** *Moderate - 6.8 miles*	***High - 5.3 miles*** *Moderate - 2.5 miles*	***High - 3.3 miles*** *Moderate - 2.5 miles*

Table S-1
Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	**Central**	**Southern**
Summary:	High impacts, associated with geologic hazards (such as slope instability and rockfalls at canyon crossings), could occur where the transmission line would cross very steep slopes (50% and greater). Moderate impacts would likely occur in areas of steep slopes (between 30 and 49%). Potential moderate impacts are also identified in areas where the line would cross geologic formations potentially yielding fossils of scientific value. Such formations include the Morrison, Cutler and Dolores. High impacts may also occur where the line crosses near known mining activity. An additional 0.7 mile of high impact would also result from dismantling the 69kV line for the Central and Southern Alternatives. All impacts are mitigable to low or no identifiable effect.		
	Soils (EIS Section 3.4)		
Impact Findings: 115 kV Line –	***High - 0.7 mile*** *Moderate - 1.4 miles*	***High - 1.1 miles*** *Moderate - 0 mile*	***High - 0 mile*** *Moderate - 0 mile*
Summary:	High impacts could occur where the project would cross very steep slopes with high erosion potential. Moderate effects are identified in high erosion potential soils characterized by steep slopes. With implementation of potential mitigation measures, all impacts are mitigable to low levels or no identifiable effect.		
	Water Resources (EIS Section 3.5)		
Impact Findings: – 115 kV Line	***High - 18*** *Moderate – 45*	***High - 11*** *Moderate - 29*	***High - 11*** *Moderate - 23*
Summary:	Impacts to water resources could occur if project-related disturbances resulted in increased sedimentation and degradation of water quality. Impacts listed above reflect numbers of crossings of water resource areas. High impacts could occur where the line would cross wetlands, water bodies, major streams with riparian values and major drainages where improved access is proposed. Moderate impacts are indicated where the project could have direct or indirect effects to adjacent wetlands, major drainages, minor drainages with riparian values and minor drainages where improved access is proposed. With potential mitigation measures, high impacts could be avoided through careful pole placement or other means. It is anticipated that all impacts to water resources are mitigable to low or moderate levels.		
	Biological Resources (EIS Section 3.6)		
Impact Findings: – 115 kV Line	***Potential Impacts to Sensitive Wildlife*** ***Moderate –*** - Direct and indirect impacts to 1 riparian stream crossing and 6 non-riparian stream crossings	***Potential Impacts to Sensitive Wildlife*** ***Moderate –*** - Direct and indirect impacts to 3 riparian stream crossing and 12 non-riparian stream crossings - Potential impacts to riparian dependent sensitive wildlife – disturbance and mortality potential at 1 riparian stream crossing and 4 non-riparian stream crossings	***Potential Impacts to Sensitive Wildlife*** ***Moderate –*** - Direct and indirect impacts to 4 riparian stream crossing and 19 non-riparian stream crossings - Potential impacts to riparian dependent sensitive wildlife – disturbance and mortality potential at 1 riparian stream crossing and 6 non-riparian stream crossings
Substations –	All impacts in the low to no identifiable impact range.	All impacts in the low to no identifiable impact range.	All impacts in the low to no identifiable impact range.

Table S-1

Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	Central	Southern
Removal of 69 kV Line and Other Distribution Changes –	All impacts in the low to no identifiable impact range.	All impacts in the low to no identifiable impact range.	All impacts in the low to no identifiable impact range.
Summary:	With implementation of the EPMs that have been committed to by Tri-State, and would be required by the Forest Service and BLM on public lands, impacts to vegetation communities, including riparian habitats, should be low. Similarly, many impacts to special status wildlife would also be minimized to low or moderate levels through implementation of the EPMs including potential mortalities to bald eagles and other raptors due to collisions with or electrocutions from the powerlines. Potentially high impacts have been identified where the project may result in indirect impacts to Mexican spotted owls, due to suitable habitat within one mile of the ROW, and to southwestern willow flycatchers, due to suitable habitat within 0.25 mile of the alignment. High impacts to Gunnison sage grouse also reflect potential indirect impacts due to disturbances to suitable habitat within one mile of the alignment. Moderate impacts have been identified for potential direct and indirect impacts to bald eagle day roost sites and to important winter ranges for elk and mule deer.		
Cultural Resources (EIS Section 3.7)			
Impact Findings: 115 kV Line and Substations –	***High Impact Potential –*** – 155.1 acres ***Moderate Impact Potential –*** – 4867.7 acres	***High Impact Potential –*** - 329.2 acres ***Moderate Impact Potential –*** - 4062.6 acres	***High Impact Potential –*** - 504.5 acres ***Moderate Impact Potential –*** - 3815.7 acres
Removal of 69 kV Line and Other Distribution Changes –	***High or Moderate Impact Potential –*** – 0 acres	***Moderate Impact Potential –*** – 139.2 acres	***Moderate Impact Potential –*** – 190.4 acres
Summary:	Potential impacts to cultural resources are based upon the cultural resource sensitivity of the landscapes and the degree of disturbance that project-related access would cause. Within the project area, high sensitivity areas include areas within one mile of canyon rims with permanent water, overhangs and ridge tops, areas of pinyon/juniper on the edges of sagebrush, and historical mining and agricultural settlements. Impacts shown reflect the potential sensitivity of lands within the alternative corridors. Impacts to cultural resources would be mitigable to low levels through implementation of the EPMs, including conducting 100% surveys of the final alignment, access roads and pole sites.		
Land Use (EIS Section 3.8)			
Potential Jurisdictions Affected: 115 kV Line –	Forest Service: none BLM: 1.5 miles State of Colorado: none Montrose County private lands -11.1 miles San Miguel County private lands - 3.9 miles	Forest Service: none BLM: 4.2 miles State of Colorado: none Montrose County private lands - 11.5 miles San Miguel County private lands - 3.8 miles	Forest Service: none BLM: 8.5 miles State of Colorado: none Montrose County private lands - 3.4 miles San Miguel County private lands - 6.3 miles
Substations –	San Miguel County - 2 acres	San Miguel County - 2 acres	San Miguel County - 2 acres
69 kV Line Removal and Other Distribution Changes –	None	BLM: 1.5 miles Montrose County private lands - 9.2 miles	BLM: 1.5 miles Montrose County private lands - 9.9 miles San Miguel County private lands - 3.9 miles

Table S-1

Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	**Central**	**Southern**
Impact Findings: **115 kV Line, Substations, Removal of 69 kV line and Distribution Changes –**	***Existing Land Uses:*** ***High -*** – Community of Redvale – Irrigated Agriculture - 3.8 miles – Prime farmlands – 4.0 miles – Potential direct impacts to residential structures within ROW: 4 ***Moderate –*** – Irrigated Agriculture boundaries - 3.3 miles – Indirect impacts to non-residential structures: 3 – Indirect impacts to residences within 300 feet of alignment: 21 – Indirect impacts to residences within 0.5 mile of alignment: 145	***Existing Land Uses:*** ***High -*** – Irrigated Agriculture - 0.8 mile – Prime farmlands - 1.0 mile – Potential direct impacts to residential structures within ROW: 3 ***Moderate –*** – Irrigated Agriculture boundaries - 2.4 miles – Indirect impacts to residences within 300 feet of alignment: 5 – Indirect impacts to residences within 0.5 mile of the alignment: 96 *Beneficial Effects –* – Community of Redvale and other residential and agricultural areas currently affected by the portion of the 69 kV line. Removal of line would eliminate any ongoing land use impacts.	***Existing Land Uses:*** ***High -*** – Irrigated Agriculture - 0.3 mile ***Moderate –*** – Indirect impacts to residences within 300 feet of alignment: 5 – Indirect impacts to residences within 0.5 mile of alignment: 40 *Beneficial Effects –* – Community of Redvale and other residential and agricultural areas currently affected by the portion of the 69kV line. Removal of line would eliminate any ongoing land use impacts.
Land Use (EIS Section 3.8) ***Impact Findings:*** ***115 kV Line, Substations, Removal of 69 kV line and Distribution Changes –*** ***continued***	***Planned Land Uses:*** ***High –*** San Miguel County Priority Class Lands Affected – – irrigated farmlands and meadows: 2.5 miles; – skylines visible from SH 145: see section 3.10 visual resources summary – impacts to natural streams and ponds: see section 3.5 water resources summary; – geologic hazard areas: see section 3.3 summary – impacts to critical wildlife areas: see section 3.6 biology summary – impacts to significant cultural resources: see section 3.7 summary ***Moderate –*** BLM Wildlife Management Emphasis Areas Crossed	***Planned Land Uses:*** ***High –*** San Miguel County Priority Class Lands Affected – – irrigated farmlands and meadows: 2.5 miles; – impacts to natural streams and ponds: see section 3.5 water resources summary; – geologic hazard areas: see section 3.3 summary – impacts to critical wildlife areas: see section 3.6 biology summary – impacts to significant cultural resources: see section 3.7 summary ***Moderate –*** – skylines visible from SH 145: see section 3.10, visual resources summary	***Planned Land Uses:*** ***High –*** San Miguel County Priority Class Lands Affected – – irrigated farmlands and meadows: 0.3 miles; – impacts to natural streams and ponds: see section 3.5 water resources summary; – geologic hazard areas: see section 3.3 summary – impacts to critical wildlife areas: see section 3.6 biology summary – impacts to significant cultural resources: see section 3.7 summary ***Moderate –*** – skylines visible from SH 145: see section 3.10, visual resources summary

Table S-1
Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	**Central**	**Southern**
Summary:	Potential impacts addressed in this section include direct and indirect effects to existing residential, commercial, industrial and agricultural land uses and conformity with adopted plans of the Forest Service, BLM and Counties. High impacts are identified in instances where direct conflicts with existing land uses, that are socially and economically important, could result. Moderate effects are identified where indirect effects to existing land uses would occur during the short-term construction phase. Impacts to existing land uses are considered to be mitigable to low or moderate levels through careful pole placement and final ROW planning and design. Potential effects to San Miguel County reflect the degree to which the project would affect lands identified in the Comprehensive Development Plan (CDP, 1999) as Priority Class 2 or 3 lands that should be avoided in siting power lines. No priority class I lands would be affected.		
	Recreation (EIS Section 3.9)		
Impact Findings: 115 kV Line, Substations, 69 kV Line Removal and Other Distribution Changes –	***High Impacts: 0*** *Moderate Impacts:* scenic driving along Unaweep-Tabeguache Scenic Byway (see 3.10 visual resources summary)	***High Impacts: 0*** *Moderate Impacts*: hunting and dispersed recreation use along Naturita Canyon rim	***High Impacts: 0*** *Moderate Impacts:* hunting and dispersed recreational use in Naturita Canyon
Summary:	Potential impacts to quality of recreational experiences would primarily occur during project construction when equipment, vehicles, and construction activities would cause short-term noise, dust and visual impacts. Dispersed recreational activities in Naturita Canyon and on BLM lands would primarily be affected, as well as private hunting areas.		
	Visual Resources (EIS Section 3.10)		
Impact Findings: 115 kV Line –	Landscape Impacts - - *Moderate* to Low BLM VRM Classes Affected - - VRM Class III 1.5 miles Scenic Highway Views - - *Moderate*: 17 highway miles Residential Views - - *Moderate* : 166 residences within foreground viewing distance	Landscape Impacts - - *Moderate* to Low BLM VRM Classes Affected - - VRM Class III 4.2 miles Scenic Highway Views - - *Moderate:* 6.5 highway miles Residential Views - - *Moderate*: 102 residences within foreground viewing distance	Landscape Impacts - **- *High*** - Naturita Canyon crossing - *Moderate* to Low elsewhere BLM VRM Classes Affected - - VRM Class III 8.5 miles Scenic Highway Views - - Low: 0.6 highway mile Residential Views - **- *High***: 10 (approx.) within foreground and middleground viewing distance - *Moderate*: 39 within foreground viewing distance
Substations –	Norwood Substation - Moderate Oakhill Substation removal - Beneficial (slightly)	Norwood Substation - Moderate Oakhill Substation removal - Beneficial (slightly)	Norwood Substation - Moderate Oakhill Substation removal - Beneficial (slightly)

Table S-1

Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	**Nucla-Norwood Alternatives**		
	Northern	**Central**	**Southern**
Removal of 69 kV line and Other Distribution Changes –	*Moderate to* ***High*** *-* – Community of Redvale	*Beneficial* - – Community of Redvale	*Beneficial* - – Community of Redvale
	Views from Dispersed Recreation Areas - - Low	Views from Dispersed Recreation Areas - - Low	Views from Dispersed Recreation Areas - - *Moderate*
Summary:	Visual impacts would be long-term and would result from the introduction of facilities into landscapes and views that are considered sensitive by the public or land management agencies. Severity of impacts depends upon the sensitivity of the area, the visual absorption capability of the landscape, the viewing distance, and the degree of contrast in line, form, color, and texture that the project would create. Visual contrasts in agricultural settings were generally found to be moderate in degree; while greater contrasts were noted in natural landscapes, particularly at Naturita Canyon due to long views of conductors and the potential for marker balls being required by FAA at canyon crossing.		
Socioeconomics (EIS Section 3.11)			
Impact Findings: 115 kV Line, Substations, 69 kV Line Removal and Other Distribution Changes –	***High*** *to Moderate* – – Potential impacts to property values: houses/lots within 300 feet of alignment - 26/34 – Social concerns about non-renewable energy use *Beneficial Effects* – – Local Tax Revenues – Increased Power Reliability	***High*** *to Moderate* – – Potential impacts to property values: houses/lots within 300 feet of alignment -7/16 – Social concerns about non-renewable energy use *Beneficial Effects* – – Local Tax Revenues – Increased Power Reliability	***High*** *to Moderate* – – Potential impacts to property values: houses/lots within 300 feet of alignment - 8/2 – Social concerns about non-renewable energy use *Beneficial Effects* – – Local Tax Revenues – Increased Power Reliability
Summary:	High or moderate direct and indirect impacts to local communities, housing and services, would not result from the presence of crews and activities during the short-term construction phase. The majority of the construction work force would be from nearby communities (e.g. Montrose, Norwood, Ridgway). The project would have beneficial effects on the local economy due to spending by construction crews and increases in tax revenues to local jurisdictions. Potentially adverse effects include effects of the project on local property values.		
Transportation (EIS Section 3.12)			
Impact Findings: 115 kV Line, Substations, 69 kV Line Removal and Other Distribution Changes –	*Moderate* – – Short-term impacts to SH 145	Low – – Short-term impacts to local roads and traffic conditions	Low – – Short-term impacts to local roads and traffic conditions

Table S-1

Summary of Impact Findings - Nucla-Norwood Primary System Alternatives

Evaluation Factors	Nucla-Norwood Alternatives		
	Northern	Central	Southern
Access Roads (Miles of roads to be used/improved) –	BLM roads: 0.6 mile Montrose and San Miguel county roads: 15.7 miles	BLM roads: 9.3 miles Montrose and San Miguel county roads: 39.2 miles	BLM roads: 21.8 miles Montrose and San Miguel county roads: 60.2 miles
Summary:	Construction of the project may require new roads or improvements to existing roads that could impact natural resources. Natural resource impacts are discussed in the respective resource sections (e.g. Soils, Water Resources, Biological Resources). The construction and maintenance of the project would also require the use of existing public BLM roads and local county roads. Construction crews may also cause short-term impacts to traffic and traffic delays. All traffic-related impacts are considered short-term and mitigable through standard traffic control measures.		
Noise (EIS Section 3.13)			
Impact Findings: 115 kV Line, Substations, 69 kV Line Removal and Other Distribution Changes –	*Moderate* – – 92 residences within the corridor	***High*** – – quality of dispersed recreation and residential settings due to helicopter construction *Moderate* to Low – – 39 residences within corridor	***High*** - – quality of dispersed recreation and residential settings due to helicopter construction *Moderate* to Low – – 16 residences within corridor
Summary:	Construction activities may cause short-term noise impacts due to construction crews, activities and equipment. Potentially high short-term effects may occur to sensitive receptors (e.g. residents, recreationists) when helicopter construction methods are used. Impacts are considered mitigable, with residual effects being in the low to moderate range. Long-term noise impacts to residents located near substations would be low.		
Human Health and Safety (EIS Section 3.14 and Appendix H)			
Impact Findings: 115 kV Line, Substations, 69 kV Line Removal and Other Distribution Changes –	No adverse effects anticipated.	No adverse effects anticipated.	No adverse effects anticipated.
Summary:	Over most of the ROW, the electric field would be below the perception level for humans. Anticipated use of the right-of-way is transitory. Both electric and magnetic fields from the proposed line outside the ROW would be comparable or lower than levels of magnetic fields measured close to some common household appliances. Operational experience over several decades with 230 kV and higher voltage transmission lines has indicated no adverse biological or health effects related to electric or magnetic field exposure. The current state of epidemiological and laboratory evidence is not sufficient to support a conclusion that the proposed transmission line poses any adverse health or biological effects. Therefore, the electric and magnetic fields of the project are not anticipated to cause adverse health or biological effects.		

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
	Summary of Project Characteristics	
PROJECT CHARACTERISTICS:		
Length of Line:	28.3 miles	29.5 miles
Jurisdiction – By Public and Private		
- Public BLM	*1.1 mile*	*6.3 miles*
- U.S. Forest Service	*1.1 mile*	*0.7 mile*
- State of Colorado	*0.6 mile*	*None*
- Private (San Miguel County)	*25.5 miles*	*22.5 miles*
Approximate No. of Poles by Type		
- Single Poles	*305*	*305*
- H-frame and 3-Pole Structures	*20*	*35*
Total No. of Pole Structures	*325*	*340*
Estimated Amount of Ground Disturbance	*174.2 acres*	*262.2 acres*
	Climate and Air Quality (EIS Section 3.2)	
Impact Findings: **115 kV Line, Substations, 69kV Removal and Other Distribution Changes –**	Low *to Moderate*	Low *to Moderate*
Summary:	Short-term impacts on air quality may result from construction equipment and vehicles due to the increased fugitive dust, hydrocarbons, carbon monoxide and nitrogen dioxide. Impacts would be greatest near residences and where access roads are improved. No high impacts would occur since effects would be short-term and no violation of air quality standards would result. Although the Telluride Substation and eastern edge of this alternative are located in the Telluride PM10 non-attainment area, implementation of this project would not cause or contribute to the non-attainment designation. PM10 levels in the area have been below the standard since 1995 and the trend through 1997 has been decreasing. In addition, the greatest potential for emissions to occur with any of the alternatives is during the spring/summer construction period, while the greatest levels in PM10 typically occur during the winter periods.	

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Geology, Paleontology and Mineral Resources (EIS Section 3.3)		
Impact Findings: **115 kV Line –**	***High - 3.2 miles*** *Moderate - 7.0 miles*	***High - 6.2 miles*** *Moderate - 4.5 miles*
Summary:	High impacts, associated with geologic hazards (such as slope instability and rockfalls at canyon crossings), could occur where the transmission line would cross very steep slopes (50% and greater). Moderate impacts would likely occur in areas of steep slopes (between 30 and 49%). Potential moderate impacts are also identified in areas where the line would cross geologic formations potentially yielding fossils of scientific value. Such formations include the Morrison, Cutler and Dolores. High impacts may also occur where the line crosses near known mining activities (Norwood-Telluride:3 sites; Norwood-Sunshine: 1 site) and in very steep slope areas with uranium resources. Mitigation measures could be used to reduce potential impacts to low levels.	
Soils (EIS Section 3.4)		
Impact Findings: **115 kV Line –**	***High - 2.8 miles*** *Moderate - 4.3 miles*	***High - 9.6 miles*** *Moderate - 2.7 miles*
Summary:	High impacts could occur where the project would cross very steep slopes with high erosion potential. Moderate effects are identified in high erosion potential soils characterized by steep slopes. With implementation of potential mitigation measures, impacts are mitigable to low levels.	
Water Resources (EIS Section 3.5)		
Impact Findings: **115 kV Line –**	***High - 21*** *Moderate - 33*	***High - 19*** *Moderate 29*
Summary:	Impacts to water resources could occur if project-related disturbances resulted in increased sedimentation and degradation of water quality. Impacts listed above reflect numbers of crossings of water resource areas. High impacts could occur where the line would cross wetlands, water bodies, major streams with riparian values and major drainages where improved access is proposed. Potentially high impacts would occur along the Norwood-Sunshine Alternative at 5 major drainage crossings, including Fall Creek, Beaver Creek, a tributary to Beaver Creek, Gurley Canyon, and Saltado Creek. Approximately 15 small wetlands, that could be spanned are also crossed. High impacts along the Norwood-Telluride Alternative include these drainage crossings, as well as 3 additional drainages and wetlands along the San Miguel River Canyon. Moderate impacts are indicated where the project could have direct or indirect effects to adjacent wetlands, major drainages, minor drainages with riparian values and minor drainages where improved access is proposed. With potential mitigation measures, high impacts could be avoided through careful pole placements or other means. It is anticipated that all impacts to water resources are mitigable to low or moderate levels.	

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Biological Resources (EIS Section 3.6)		
Impact Findings: **115 kV Line –**	*Moderate –* - Direct loss of habitat for Mexican Spotted Owl, if present. 48 acres of suitable habitat within the ROW - Potential direct mortality impacts to Boreal toad – 143 acres of ROW within ½ mile of breeding habitat - Indirect impacts to Gunnison sage grouse due to increased avian predation, and habitat avoidance from presence of overhead structures. Moderate impacts to Beaver Mesa population. 3,090 acres of overall range. 1,720 acres of nesting habitat within 1 mile of line. - Disturbance or mortality to other riparian dependent sensitive wildlife. Moderate impacts. 6 riparian stream crossings and 19 non-riparian stream crossings	*Moderate –* - Direct loss of habitat for Mexican Spotted Owl, if present. 134 acres of suitable habitat within the ROW - Potential direct mortality impacts to Boreal toad – 79 acres of ROW within ½ mile of breeding habitat - Indirect impacts to Gunnison sage grouse due to increased avian predation, and habitat avoidance from presence of overhead structures. Moderate impacts to Beaver Mesa population. 3,090 acres of overall range. 1,720 acres of nesting habitat within 1 mile of line - Disturbance or mortality to other riparian dependent sensitive wildlife. Moderate impacts. 9 riparian stream crossings and 16 non-riparian stream crossings
Substations –	No high or moderate impacts	No high or moderate impacts
Removal of 69 kV Line and Other Distribution Changes –	*Moderate –* - Disturbance or mortality to other riparian dependent sensitive wildlife. Moderate impact. Parallels 1 riparian stream for ¼ mile and 1 non-riparian stream crossing	*Moderate -* - Direct loss of Mexican spotted owl habitat. Moderate impacts if spotted owls are present. 38 acres of suitable habitat within the ROW.
Summary:	With implementation of the EPMs that have been committed to by Tri-State, and would be required by the Forest Service and BLM on public lands, impacts to vegetation communities, including riparian habitats, should be low. Similarly, many impacts to special status wildlife would also be minimized to low or moderate levels through implementation of the EPMs including potential mortalities to bald eagles and other raptors due to collisions or electrocutions from the power lines. Potentially high impacts have been identified where the project may result in indirect impacts to Mexican spotted owls, due to suitable habitat within one mile of the ROW, to Southwestern willow flycatchers, due to suitable habitat within 0.25 mile of the alignment, and to Boreal toads due to loss of habitat and potential for mortalities. High impacts to Gunnison sage grouse also reflect potential indirect impacts due to disturbances to suitable habitat within one mile of the alignment. Moderate impacts have been identified for potential direct and indirect impacts to bald eagle day roost sites and to important winter ranges for elk and mule deer.	

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Cultural Resources (EIS Section 3.7)		
Impact Findings: 115 kV Line and Substations –	*High Impact Potential* – – 405.5 Acres *Moderate Impact Potential* – – 4,773.6 Acres	*High Impact Potential* – – 405.9 Acres *Moderate Impact Potential* – – 4,576 Acres
Removal of 69 kV Line and Other Distribution Changes –	*High Impact Potential* -- – 6.8 Acres	*High Impact Potential* -- – 6.8 Acres
Summary:	Potential impacts to cultural resources are based upon the cultural resource sensitivity of the landscapes and the degree of disturbance that project-related access would cause. Within the project area, high sensitivity areas include areas within one mile of canyon rims with permanent water, overhangs and ridge tops, areas of pinyon juniper on the edges of sagebrush, areas of historical mining and agricultural settlements. Impacts shown reflect the potential sensitivity of lands within the alternative corridors. Impacts to cultural resources would be mitigable to low levels through implementation of the EPMs, including conducting 100% surveys of the final alignment, access roads and pole sites.	
Land Use (EIS Section 3.8)		
Potential Jurisdictions Affected: **115 kV Line –**	Forest Service: 1.1 miles BLM: 1.1 mile State of Colorado: 0.6 mile San Miguel County private lands: 25.1 miles	Forest Service: 0.7 mile BLM: 6.3 miles State of Colorado: none San Miguel County private lands: 22.5 miles
Substations –	.09 Acre (.05 UNF; .04 County)	.04 Acre (.02 UNF; .02 County)
Removal of 69 kV Line and Other Distribution Changes –	Forest Service: none BLM: none State of Colorado: none San Miguel County private lands: 2.4 mile	Forest Service: none BLM: none State of Colorado: 0.6 mile San Miguel County private lands: 2.4 mile

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Impact Findings: **115 kV Line, Substations and Distribution Lines –**	***Existing Land Uses:*** ***High -*** – Irrigated Agriculture - 1.0 mile – Prime farmlands – 0.1 mile – Potential direct impacts to residential structures in ROW: 2 structures	***Existing Land Uses:*** ***High -*** – Irrigated Agriculture - 1.0 mile – Prime farmlands – 0.1 mile – Potential direct impacts to residential structures in ROW: 2 structures
	Moderate - – Indirect impacts to residences within 300 feet of alignment: 10 – Indirect impacts to residences within 0.5 mile of alignment: 92 – Direct and indirect impacts to approved developments: 6 (Fitts Sub., Beaver Pines, Specie Mesa Ranch, Top of the World, Wilson Mesa Ranch and Ptarmigan Ranch)	*Moderate* – – Indirect impacts to residences within 300 feet of alignment: 11 – Indirect impacts to residences within 0.5 mile of alignment: 81 – Direct and indirect impacts to approved developments: 4 (Fitts Sub., Beaver Pines, Specie Mesa Ranch, Top of the World)
Land Use (EIS Section 3.8) **Impact Findings:** **115 kV Line, Substations and Distribution Lines –** **continued**	***Planned Land Uses:*** ***High –*** San Miguel County Priority Lands Affected – – irrigated farmlands, meadows and pastures: 11.3 mile – skylines visible from SH 145: no identifiable effect – impacts to natural streams and ponds: see section 3.5 water resources summary – geologic hazards: see section 3.3 summary – impacts to critical wildlife areas: see section 3.6 biological resources summary – impacts to lands having significant cultural resources: see section 3.7 cultural resource summary *Moderate* – – Forest Service Management Area 2B: 1.1 miles crossed – BLM Emphasis Areas L1 (San Miguel River ACEC) and C1 (San Miguel River Canyon SRMA): 1.1 miles	***Planned Land Uses:*** ***High –*** San Miguel County Priority Lands Affected – – irrigated farmlands, meadows and pastures: 7.4 mile – skylines visible from SH 145: see section 3.10 visual resources summary – impacts to natural streams and ponds: see section 3.5 water resources summary – geologic hazards: see section 3.3 summary – impacts to critical wildlife areas: see section 3.6 biological resources summary – impacts to lands having significant cultural resources: see section 3.7 cultural resource summary *Moderate* – – Forest Service Management Area 2B: 0.7 mile crossed – BLM Emphasis Areas L1 (San Miguel River ACEC) and C1 (San Miguel River Canyon SRMA): 6.3 miles
Summary:	Potential impacts addressed in this section include direct and indirect effects to existing residential, commercial, industrial and agricultural land uses and conformity with adopted plans of the Forest Service, BLM and Counties. High impacts are identified in instances where direct conflicts with existing land uses that are important socially and economically may occur. Moderate effects are identified where indirect effects to existing land uses would occur during the short-term construction phase. Impacts to existing land uses are considered to be mitigable to low or moderate levels through careful pole placement and final ROW planning and design. Potential effects to San Miguel County reflect the degree to which the project would affect lands identified in the Comprehensive Development Plan (CDP, 1999) as Priority Class 2 or 3 lands that should be avoided in siting powerlines. No priority class I lands would be affected.	

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Recreation (EIS Section 3.9)		
Impact Findings: **115 kV Line, Substations and Distribution Lines –**	***High Impacts:*** None Impacts Low to *Moderate*	*Moderate to* ***High Impacts:*** – San Miguel River Corridor, San Miguel River activities, boater put-ins at Bilk Creek and Deep Creek Galloping Goose Trail, Mary E. Campground, impacts to scenic driving along SH 145 (see section 3.10, visual resource summary)
Summary:	Potential impacts to quality of recreation experiences would primarily occur during the project construction period, when equipment, vehicles, helicopters and related activities would cause short-term noise, dust and visual impacts. Impacts would be greatest in areas of helicopter construction and where recreation activities would be disrupted, particularly along the San Miguel River corridor.	
Visual Resources (EIS Section 3.10)		
Impact Findings: **115 kV Line –**	**Landscape Impacts:** – ***High:*** at 5 canyon crossings due to color contrasts of marker balls; – *Moderate to* ***High***: across agriculture, open meadows and pastures (11.3 miles); high mesas with adjacent mountain scenery influences (16.6 miles); including conifers (1.9 miles) and aspen stands (2.0 miles) **Sensitive Viewer Impacts:** – *Moderate to* ***High:*** Faraway Ranch private recreation area; up to 92 residences within FG distance zone; subdivision lots within FG distance zone; residences within MG distance zone with scenic view conflicts – *Moderate:* Specie Mesa Road (M44) and Bilk Creek Road/Trail (62.K); subdivision lots in MG distance zone with scenic view conflicts	**Landscape Impacts:** – ***High:*** at 4 canyon crossings due to color contrasts of marker balls, across San Miguel River canyon slopes, and at crossings of visually prominent ridge lines (10.9 miles) – *Moderate to* ***High***: across agriculture, open meadows and pastures (7.4 miles); high mesas with adjacent mountain scenery influences (8.3 miles); including conifers (8.0 miles) and aspen stands (2.5 miles) **Sensitive Viewer Impacts:** – ***High:*** San Juan Skyway National Scenic Byway (SH 145 - 5 miles); Telluride Ski Resort gondola views; Last Dollar Road (T.60), San Miguel River Canyon SRMA, and County Road P.58 – *Moderate to* ***High:*** up to 81 residences within FG distance zone; subdivision lots within FG distance zone; residences within MG distance zone with scenic view conflicts; Bilk Creek Road/Trail (62.K) – *Moderate:* Specie Mesa Road (M44); ; subdivision lots in MG distance zone with scenic view conflicts, Deep Creek Trail and Mt. Sneffels Wilderness Area
Substations –	Low: Sunshine Substation, Specie Mesa and Wilson Mesa Substations	Low: Telluride and Specie Mesa Substation s - Low *Beneficial*: Removal of Wilson Mesa Substation

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Removal of 69 kV Line and Other Distribution Changes –	*Moderate to* ***High:*** to residences from underbuilding of distribution lines across Fitts Subdivision and Specie Mesa	*Moderate to* ***High:*** to residences from underbuilding of distribution lines across Fitts Subdivisions and Specie Mesa *Beneficial Effects:* to residences and Faraway private recreation area from removal of existing 69 kV line between Wilson Mesa Substation and Sunshine Substation
Summary:	Visual impacts would be long-term and would result from the introduction of facilities into landscapes and views that are considered sensitive by the public or land management agencies. Severity of impacts depends upon the sensitivity of the area, the visual absorption capability (VAC) of the landscape, the viewing distance, and the degree of contrast in line, form, color, and texture that the project would create. Visual contrasts in agricultural settings were generally found to be moderate in degree due to the presence of cultural features with similar form and line visual elements. Moderate to high impacts are assessed in predominately natural landscapes with natural scenic amenities, including the high mesas with adjacent scenery influences of the San Juan Mountains and the San Miguel River Canyon and tributaries. In these types of landscapes, the scale of the poles and the horizontal lines of the conductors may cause strong contrasts, depending upon specific viewing conditions and the VAC of the land. In these landscape character types, high impacts are generally assessed for sensitive viewers within the foreground (FG) viewing distance zone (within 0.5 mile), and for viewers in the middle ground (MG) distance zone (0.5 to 3.0 miles) where the conductors may be visible and conflict with scenic views and vistas. High impacts are also assessed at canyon crossings where FAA may require colored marker balls for safety purposes.	
Socioeconomics (EIS Section 3.11)		
Impact Findings: **115 kV Line, Substations, 69kV Removal and Other Distribution Changes –**	***High*** *to Moderate –* – Potential impacts to property values: houses/lots within 300 feet of alignment - 10/NA – Social concerns about non-renewable energy use *Beneficial Effects –* – Local Tax Revenues – Increased Power Reliability	***High*** *to Moderate –* – Potential impacts to property values: houses/lots within 300 feet of alignment -11/NA – Social concerns about non-renewable energy use *Beneficial Effects –* – Local Tax Revenues – Increased Power Reliability
Summary:	High or moderate direct and indirect impacts to local communities, housing and services, would not result from the presence of crews and activities during the short-term construction phase. The majority of the construction work force would be from nearby communities (e.g. Montrose, Norwood, Ridgway). The project would have beneficial effects on the local economy due to spending by construction crews and increases in tax revenues to local jurisdictions. Potentially adverse effects include effects of the project on local property values.	

Table S-2
Summary of Impact Findings
Norwood to Sunshine Substation Alternative and Norwood to Telluride Substation Alternative

Evaluation Factors	Norwood-Sunshine Alternative	Norwood-Telluride Alternative
Transportation (EIS Section 3.12)		
Impact Findings: **115 kV Line, Substations, 69 kV Removal and Other Distribution Changes –**	Low - – Short-term impacts to public BLM and local roads	Low to *Moderate* - – Short-term impacts to SH 145 and SH 145/South Fork Road interchange
Access Roads (Miles of roads to be used/improved) –	BLM and FS roads: 25.8 miles Montrose and San Miguel County roads: 70.4 miles	BLM and FS roads: 21.3 miles Montrose and San Miguel County roads: 60.7 miles
Summary:	Construction of the project may require new roads or improvements to existing roads that could impact natural resources. Natural resource impacts are discussed in the respective resource sections (e.g. Soils, Water Resources, Biological Resources). The construction and maintenance of the project would also require the use of existing public BLM roads and local county roads. Construction crews may also cause short-term impacts to traffic and traffic delays. All traffic-related impacts are considered short-term and mitigable through standard traffic control measures.	
Noise (EIS Section 3.13)		
Impact Findings: **115 kV Line, Substations, 69 kV Removal and Other Distribution Changes –**	***High -*** Approximately 25 residences located near helicopter construction activities Low to *Moderate* - Approximately 48 residences within the corridor	***High -*** Approximately 7 residences, 1 school, and public recreation lands located near helicopter construction activities *Low to Moderate* - Approximately 44 residences within the corridor
Summary:	Construction activities may cause short-term noise impacts due to construction crews, activities and equipment. Potentially high short-term effects may occur to sensitive receptors (e.g. residents, recreationists) when helicopter construction methods are used. Impacts are considered mitigable, with residual effects being in the low to moderate range. Long-term noise impacts to residents located near substations would be low.	
Human Health and Safety (EIS Section 3.14 and Appendix H)		
Impact Findings: **115 kV Line, Substations, 69 kV Removal and Other Distribution Changes –**	No adverse effects anticipated.	No adverse effects anticipated
Summary:	Over most of the ROW, the electric field would be below the perception level for humans. Anticipated use of the right-of-way is transitory. Both electric and magnetic fields from the proposed line outside the ROW would be comparable or lower than levels of magnetic fields measured close to some common household appliances. Operational experience over several decades with 230 kV and higher voltage transmission lines has indicated no adverse biological or health effects related to electric or magnetic field exposure. However, the current state of epidemiological and laboratory evidence is not sufficient to support a conclusion whether the proposed transmission line poses any adverse health or biological effects.	

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